

10/523503
DTOT Rec'd PCT/PT- #4
02 FEB 2005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Atty. Docket No: 16313-0236

In re International patent application of

BASF PLANT SCIENCE GMBH

International Application No. PCT/US03/24364

International Filing Date: August 4, 2003

For: SUGAR AND LIPID METABOLISM REGULATORS IN PLANTS IV

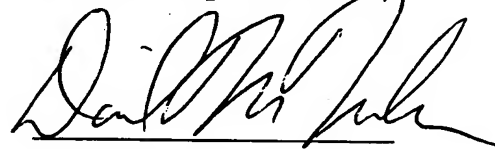
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Mail Stop PCT SEQUENCE

STATEMENT ACCOMPANYING SEQUENCE LISTING

Dear Sir:

The undersigned hereby states that the Sequence Listing submitted concurrently herewith does not include matter which goes beyond the content of the application as filed and that the information recorded on the diskette submitted concurrently herewith is identical to the written Sequence Listing.

Respectfully submitted,



David M. Narkunas
Reg. No. 53,370

Sept. 30, 2003
Date

HARBOR CONSULTING IP SERVICES, INC.
1500A Lafayette Road, #262
Portsmouth, N.H.
800-318-3021

10/525503

DT01 Rec'd PCT/ 02 FEB 2005

1/121

SEQUENCE LISTING

<110> BASF PLANT SCIENCE GMBH

<120> SUGAR AND LIPID METABOLISM REGULATORS IN PLANTS IV

<130> 16313-0236

<140> PCT/US03/24364

<141> 2003-08-04

<150> US 60/400,803

<151> 2002-08-02

<160> 163

<170> PatentIn version 3.2

<210> 1

<211> 300

<212> DNA

<213> Arabidopsis thaliana

<400> 1

atggcaatct tccgaagtac actagtttta ctgctgatcc tcttctgcct caccactttt	60
gagcttcctg ttcctgctgc tgaagattca caagtcggtg aaggcgtagt gaaaattgat	120
tgcggtggga gatgcaaagg tagatgcagc aaatcgctga ggccaaatct gtgtttgaga	180
gcatgcaaca gctgttgcta ccgctgcaac tgtgtgccac caggcaccgc cgggaaccac	240
cacctttgtc cttgctacgc ctccattacc actcggtggtg gccgtctcaa gtgcccttaa	300

<210> 2

<211> 99

<212> PRT

<213> Arabidopsis thaliana

<400> 2

Met	Ala	Ile	Phe	Arg	Ser	Thr	Leu	Val	Leu	Leu	Leu	Ile	Leu	Phe	Cys
1				5					10					15	

Leu	Thr	Thr	Phe	Glu	Leu	His	Val	His	Ala	Ala	Glu	Asp	Ser	Gln	Val
			20					25					30		

Gly	Glu	Gly	Val	Val	Lys	Ile	Asp	Cys	Gly	Gly	Arg	Cys	Lys	Gly	Arg
		35					40					45			

Cys	Ser	Lys	Ser	Ser	Arg	Pro	Asn	Leu	Cys	Leu	Arg	Ala	Cys	Asn	Ser
		50					55				60				

2/121

Cys Cys Tyr Arg Cys Asn Cys Val Pro Pro Gly Thr Ala Gly Asn His
65 70 75 80

His Leu Cys Pro Cys Tyr Ala Ser Ile Thr Thr Arg Gly Gly Arg Leu
85 90 95

Lys Cys Pro

<210> 3
<211> 1245
<212> DNA
<213> Arabidopsis thaliana

<400> 3
atggagaatg gagcaacgac gacgagcaca attaccatca aagggattct gagtttgcta 60
atggaaagca tcacaacaga ggaagatgaa ggaggaaaga gagtaatata tctgggaatg 120
ggagacccaa cactctactc gtgttttcgt acaacacaag tctctcttca agctgtttct 180
gattctcttc tctccaacaa gttccatggt tactctccta ccgtcgggtct tccccaagct 240
cgaagggcaa tagcagagta tctatcgcgt gatcttccat acaaactttc acaggatgat 300
gtgtttatca catcgggttg cacgcaagcg atcgatgtag cattgtcgat gttagctcgt 360
cccagggcta atatacttct tccaaggcct ggtttcccaa tctatgaact ctgtgctaag 420
tttagacacc ttgaagtctg ctacgtcgat cttcttccgg aaaatggatg ggagatcgat 480
cttgatgctg tcgaggctct tgcagacgaa aacacggttg ctttggttgt tataaacctt 540
ggtaatcctt gcgggaatgt ctatagctac cagcatttga tgaagattgc ggaatcggcg 600
aaaaaactag ggtttcttgt gattgctgat gaggtttacg gtcattctgc ttttggttagc 660
aaaccgtttg tgccaatggg tgtgtttgga tctattgttc ctgtgcttac tcttggtctt 720
ttatcaaaga gatggatagt tccagggttg cgactcgggt gggttggtcac cactgacctt 780
tctggttcct ttaaggacct taagatcatt gagagggtta agaaatactt tgatattctt 840
gggtggaccag ctacatttat tcaggctgca gttcccacta ttttggaaca gacggatgag 900
tctttcttca agaaaacctt gaactcgttg aagaactctt cggatatttg ttgtgactgg 960
atcaaggaga ttccttgcat tgattcctcg catcgaccag aaggatccat ggcaatgatg 1020
gttaagctga atctctcatt acttgaagat gtaagtgcg atatcgactt ctgtttcaag 1080
ttagctaggg aagaatcagt catccttctt cctggggaccg cgggtggggt gaagaactgg 1140
ctgaggataa cgtttgcagc agatgcaact tcgattgaag aagcttttaa aaggatcaaa 1200

3/121

tgtttctatc ttagacatgc caagactcaa tatccaacca tatag

1245

<210> 4

<211> 414

<212> PRT

<213> Arabidopsis thaliana

<400> 4

Met Glu Asn Gly Ala Thr Thr Thr Ser Thr Ile Thr Ile Lys Gly Ile
1 5 10 15

Leu Ser Leu Leu Met Glu Ser Ile Thr Thr Glu Glu Asp Glu Gly Gly
20 25 30

Lys Arg Val Ile Ser Leu Gly Met Gly Asp Pro Thr Leu Tyr Ser Cys
35 40 45

Phe Arg Thr Thr Gln Val Ser Leu Gln Ala Val Ser Asp Ser Leu Leu
50 55 60

Ser Asn Lys Phe His Gly Tyr Ser Pro Thr Val Gly Leu Pro Gln Ala
65 70 75 80

Arg Arg Ala Ile Ala Glu Tyr Leu Ser Arg Asp Leu Pro Tyr Lys Leu
85 90 95

Ser Gln Asp Asp Val Phe Ile Thr Ser Gly Cys Thr Gln Ala Ile Asp
100 105 110

Val Ala Leu Ser Met Leu Ala Arg Pro Arg Ala Asn Ile Leu Leu Pro
115 120 125

Arg Pro Gly Phe Pro Ile Tyr Glu Leu Cys Ala Lys Phe Arg His Leu
130 135 140

Glu Val Arg Tyr Val Asp Leu Leu Pro Glu Asn Gly Trp Glu Ile Asp
145 150 155 160

Leu Asp Ala Val Glu Ala Leu Ala Asp Glu Asn Thr Val Ala Leu Val
165 170 175

Val Ile Asn Pro Gly Asn Pro Cys Gly Asn Val Tyr Ser Tyr Gln His
180 185 190

4/121

Leu Met Lys Ile Ala Glu Ser Ala Lys Lys Leu Gly Phe Leu Val Ile
195 200 205

Ala Asp Glu Val Tyr Gly His Leu Ala Phe Gly Ser Lys Pro Phe Val
210 215 220

Pro Met Gly Val Phe Gly Ser Ile Val Pro Val Leu Thr Leu Gly Ser
225 230 235 240

Leu Ser Lys Arg Trp Ile Val Pro Gly Trp Arg Leu Gly Trp Phe Val
245 250 255

Thr Thr Asp Pro Ser Gly Ser Phe Lys Asp Pro Lys Ile Ile Glu Arg
260 265 270

Phe Lys Lys Tyr Phe Asp Ile Leu Gly Gly Pro Ala Thr Phe Ile Gln
275 280 285

Ala Ala Val Pro Thr Ile Leu Glu Gln Thr Asp Glu Ser Phe Phe Lys
290 295 300

Lys Thr Leu Asn Ser Leu Lys Asn Ser Ser Asp Ile Cys Cys Asp Trp
305 310 315 320

Ile Lys Glu Ile Pro Cys Ile Asp Ser Ser His Arg Pro Glu Gly Ser
325 330 335

Met Ala Met Met Val Lys Leu Asn Leu Ser Leu Leu Glu Asp Val Ser
340 345 350

Asp Asp Ile Asp Phe Cys Phe Lys Leu Ala Arg Glu Glu Ser Val Ile
355 360 365

Leu Leu Pro Gly Thr Ala Val Gly Leu Lys Asn Trp Leu Arg Ile Thr
370 375 380

Phe Ala Ala Asp Ala Thr Ser Ile Glu Glu Ala Phe Lys Arg Ile Lys
385 390 395 400

Cys Phe Tyr Leu Arg His Ala Lys Thr Gln Tyr Pro Thr Ile
405 410

<210> 5

<211> 459

<212> DNA

<213> Arabidopsis thaliana

<400> 5

```

atggctgaaa aagtaaagtc tggcaagtt tttaacctat tatgcatatt ctcgatcttt      60
ttcttctctt ttgtgttate agtgaatggt tcggctgatg tcgattctga gagagcgggtg    120
ccatctgaag ataaaacgac gactgtttgg ctaactaaaa tcaaacgggc cggtaaaaaat     180
tattgggcta aagttagaga gactttggat cgtggacagt ccacttctt tcctccgaac      240
acatatttta cgggaaagaa tgatgcgccg atgggagccg gtgaaaatat gaaagaggcg      300
gcgacgagga gctttgagca tagcaaagcg acggtggagg aagctgctag atcagcggca      360
gaagtgggtg gtgatacggc ggaagctgtg aaagaaaagg tgaagaggag cgtttccggt      420
ggagtgcgcg agccgtcgga gggatctgag gagctataa                             459

```

<210> 6

<211> 152

<212> PRT

<213> Arabidopsis thaliana

<400> 6

```

Met Ala Glu Lys Val Lys Ser Gly Gln Val Phe Asn Leu Leu Cys Ile
1           5           10           15

```

```

Phe Ser Ile Phe Phe Phe Leu Phe Val Leu Ser Val Asn Val Ser Ala
20           25           30

```

```

Asp Val Asp Ser Glu Arg Ala Val Pro Ser Glu Asp Lys Thr Thr Thr
35           40           45

```

```

Val Trp Leu Thr Lys Ile Lys Arg Ser Gly Lys Asn Tyr Trp Ala Lys
50           55           60

```

```

Val Arg Glu Thr Leu Asp Arg Gly Gln Ser His Phe Phe Pro Pro Asn
65           70           75           80

```

```

Thr Tyr Phe Thr Gly Lys Asn Asp Ala Pro Met Gly Ala Gly Glu Asn
85           90           95

```

```

Met Lys Glu Ala Ala Thr Arg Ser Phe Glu His Ser Lys Ala Thr Val
100          105          110

```

```

Glu Glu Ala Ala Arg Ser Ala Ala Glu Val Val Ser Asp Thr Ala Glu
115          120          125

```

Ala Val Lys Glu Lys Val Lys Arg Ser Val Ser Gly Gly Val Thr Gln
 130 135 140

Pro Ser Glu Gly Ser Glu Glu Leu
 145 150

<210> 7
 <211> 1158
 <212> DNA
 <213> *Arabidopsis thaliana*

<400> 7
 atggctggag aagaaataga gagggagaag aaatctgcag catctgcaag aactcacacc 60
 agaaacaaca ctcaacaaag ttcttcttct gggtatctga aaacgcttct cctggtaacg 120
 ttcgtcggag ttttagcatg ggtttatcaa acaatccaac caccacccgc caaaatcgtc 180
 ggctctcccc gtggaccac cgtgacatca ccgaggatca aactgagaga cggaagacat 240
 ctggcttaca cagaattcgg aatccctaga gacgaagcca agttcaagat cataaacatc 300
 cacggcttcg attcttgtat gcgagactcg catttcgcc aattcttata gccggctctt 360
 gtggaggaat tgaggatata catttgtgtc tttgatcgtc ctgggttatgg agagagtgat 420
 cctaacctga atgggtcacc aagaagcata gcattggata tagaagagct tgctgatggg 480
 ttaggactag gacctcagtt ctatctcttt gggtactcca tgggtggtga aattacatgg 540
 gcatgcctta actacattcc tcacagggtta gcaggagctg cccttgtagc tccagcgatt 600
 aactattggt ggagaaactt accgggagat ttaacaagag aagctttctc tcttatgcat 660
 cctgcagatc aatgggtcact tcgagtagct cattatgctc cttggcttac atattggtgg 720
 aacactcaga aatgggtccc aatctccaat gtgattgccg gtaatcccat tattttctca 780
 cgtcaggaca tggagatctt gtcgaagctc ggattcgta atccaaatcg ggcatacata 840
 agacaacaag gtgaatatgt aagcttacac cgagatttga atgtcgcatt ttcaagctgg 900
 gagtttgatc cgttagacct tcaagatccg ttcccgaaca acaatggctc agttcacgta 960
 tggaatggcg atgaggataa gtttgtgcca gtaaagcttc aacgggtatgt cgcgtcaaag 1020
 ctgccatgga ttcggtacca tgaaatatct ggatcaggac attttgtacc atttgtggaa 1080
 ggtatgactg ataagatcat caagtcactt ttggttgggg aagaagatgt aagtgagagt 1140
 agagaagcct ctgtttaa 1158

<210> 8
 <211> 385

7/121

<212> PRT

<213> Arabidopsis thaliana

<400> 8

Met Ala Gly Glu Glu Ile Glu Arg Glu Lys Lys Ser Ala Ala Ser Ala
1 5 10 15

Arg Thr His Thr Arg Asn Asn Thr Gln Gln Ser Ser Ser Ser Gly Tyr
20 25 30

Leu Lys Thr Leu Leu Leu Val Thr Phe Val Gly Val Leu Ala Trp Val
35 40 45

Tyr Gln Thr Ile Gln Pro Pro Pro Ala Lys Ile Val Gly Ser Pro Gly
50 55 60

Gly Pro Thr Val Thr Ser Pro Arg Ile Lys Leu Arg Asp Gly Arg His
65 70 75 80

Leu Ala Tyr Thr Glu Phe Gly Ile Pro Arg Asp Glu Ala Lys Phe Lys
85 90 95

Ile Ile Asn Ile His Gly Phe Asp Ser Cys Met Arg Asp Ser His Phe
100 105 110

Ala Asn Phe Leu Ser Pro Ala Leu Val Glu Glu Leu Arg Ile Tyr Ile
115 120 125

Val Ser Phe Asp Arg Pro Gly Tyr Gly Glu Ser Asp Pro Asn Leu Asn
130 135 140

Gly Ser Pro Arg Ser Ile Ala Leu Asp Ile Glu Glu Leu Ala Asp Gly
145 150 155 160

Leu Gly Leu Gly Pro Gln Phe Tyr Leu Phe Gly Tyr Ser Met Gly Gly
165 170 175

Glu Ile Thr Trp Ala Cys Leu Asn Tyr Ile Pro His Arg Leu Ala Gly
180 185 190

Ala Ala Leu Val Ala Pro Ala Ile Asn Tyr Trp Trp Arg Asn Leu Pro
195 200 205

Gly Asp Leu Thr Arg Glu Ala Phe Ser Leu Met His Pro Ala Asp Gln
210 215 220

Trp Ser Leu Arg Val Ala His Tyr Ala Pro Trp Leu Thr Tyr Trp Trp
 225 230 235 240

Asn Thr Gln Lys Trp Phe Pro Ile Ser Asn Val Ile Ala Gly Asn Pro
 245 250 255

Ile Ile Phe Ser Arg Gln Asp Met Glu Ile Leu Ser Lys Leu Gly Phe
 260 265 270

Val Asn Pro Asn Arg Ala Tyr Ile Arg Gln Gln Gly Glu Tyr Val Ser
 275 280 285

Leu His Arg Asp Leu Asn Val Ala Phe Ser Ser Trp Glu Phe Asp Pro
 290 295 300

Leu Asp Leu Gln Asp Pro Phe Pro Asn Asn Asn Gly Ser Val His Val
 305 310 315 320

Trp Asn Gly Asp Glu Asp Lys Phe Val Pro Val Lys Leu Gln Arg Tyr
 325 330 335

Val Ala Ser Lys Leu Pro Trp Ile Arg Tyr His Glu Ile Ser Gly Ser
 340 345 350

Gly His Phe Val Pro Phe Val Glu Gly Met Thr Asp Lys Ile Ile Lys
 355 360 365

Ser Leu Leu Val Gly Glu Glu Asp Val Ser Glu Ser Arg Glu Ala Ser
 370 375 380

Val
 385

<210> 9

<211> 357

<212> DNA

<213> Arabidopsis thaliana

<400> 9

atggctggag tgatgaagtt ggcattgcatt gtcttggtt gcatgattgt ggccggtcca 60

atcacagcga acgcgcttat gagttgtggc accgtcaacg gcaacctggc aggggtgcatt 120

gcctacttga cccgaggtgc tccacttacc caagggtgct gcaacggcgt tactaacctt 180

9/121

aaaaacatgg ccagtacaac ccagaccgt cagcaagctt gccgttgctt tcaatctgcc 240
gctaaagccg ttgggtcccg tctcaacact gcccgtagc ctggacttcc tagcgcatgc 300
aaagtcaata ttccttaca aatcagcgcc agcaccaact gcaacaccgt gaggtga 357

<210> 10
<211> 118
<212> PRT
<213> Arabidopsis thaliana

<400> 10
Met Ala Gly Val Met Lys Leu Ala Cys Met Val Leu Ala Cys Met Ile
1 5 10 15

Val Ala Gly Pro Ile Thr Ala Asn Ala Leu Met Ser Cys Gly Thr Val
20 25 30

Asn Gly Asn Leu Ala Gly Cys Ile Ala Tyr Leu Thr Arg Gly Ala Pro
35 40 45

Leu Thr Gln Gly Cys Cys Asn Gly Val Thr Asn Leu Lys Asn Met Ala
50 55 60

Ser Thr Thr Pro Asp Arg Gln Gln Ala Cys Arg Cys Leu Gln Ser Ala
65 70 75 80

Ala Lys Ala Val Gly Pro Gly Leu Asn Thr Ala Arg Ala Ala Gly Leu
85 90 95

Pro Ser Ala Cys Lys Val Asn Ile Pro Tyr Lys Ile Ser Ala Ser Thr
100 105 110

Asn Cys Asn Thr Val Arg
115

<210> 11
<211> 1332
<212> DNA
<213> Arabidopsis thaliana

<400> 11
atggggcttg ctgtggtgga caaaaacaca gttgcgattt ctgcatctga tggtatgttg 60
tcctttgctg cttttccagt cgagattcct ggagaggtag tattttcttca tcccgttcac 120
aactatgctc tgattgcgta taatccatca gcaatggatc ctgccagtgc ttcagtcatt 180
cgtgcagctg agctactacc tgaacctgca ctccaacgtg gagattcagt ctatcttgtc 240

```

ggattgagta ggaaccttca agctacatca agaaaatcta ttgtaaccaa tccatgtgca 300
gcggttaaaca ttggttctgc tgattctccc cgttacagag ctactaatat ggaagtaatt 360
gagcttgata cagatttttg tagctcattt tcaggggcgc tgactgatga gcaggaaga 420
attcgggcta tttggggaag tttttcgact cagggttaa atagttccac ttcttcagaa 480
gaccaccagt ttgtcagagg tatcccagta tatgcaatca gccaaagtcct tgaaaaaatc 540
ataaccggtg gaaatggacc agctcttctc ataaatggtg tcaaaaggcc aatgccactt 600
gttcggattt tggaagtga attgtatcct actttgcttt caaaagcccg gagttttggt 660
ctgagtgatg aatggatcca agtcctagtc aagaaggatc ctggttagacg tcaagttctg 720
cgtgttaaag gttgcctggc aggatcaaaa gctgaaaacc ttcttgaaca aggcgatatg 780
gttctggcag tcaataagat gccagttaca tgcttcaatg acatagaagc tgcttgccaa 840
acattggata agggtagtta cagcgatgaa aatctcaatc taacaatcct tagacagggc 900
caagaactgg agctcgtagt tggaactgat aagagagatg ggaatggaac gacaagagtg 960
ataaattggt gcggatgcgt tgttcaggat cctcatcctg cggttcgtgc tcttggttt 1020
cttcctgagg aaggatcatg tgtctatgtc acaagatggt gtcacgggag tcccgtcac 1080
cgatatggcc tctacgcgt tcaatggatc gtggaagtta atgggaagaa gactcctgac 1140
ctaaacgcat tcgcagatgc taccaaggag ctagaacacg ggcagtttgt gcgtattagg 1200
actgttcac taaacggcaa gccacgagta ttgacctga aacaagatct ccattactgg 1260
ccgacttggg aattgaggtt cgaccagag actgctcttt ggcggagaaa tatattgaaa 1320
gccttgcat aa 1332

```

<210> 12

<211> 443

<212> PRT

<213> Arabidopsis thaliana

<400> 12

```

Met Gly Leu Ala Val Val Asp Lys Asn Thr Val Ala Ile Ser Ala Ser
1           5           10          15

```

```

Asp Val Met Leu Ser Phe Ala Ala Phe Pro Val Glu Ile Pro Gly Glu
20          25          30

```

```

Val Val Phe Leu His Pro Val His Asn Tyr Ala Leu Ile Ala Tyr Asn
35          40          45

```

11/121

Pro Ser Ala Met Asp Pro Ala Ser Ala Ser Val Ile Arg Ala Ala Glu
50 55 60

Leu Leu Pro Glu Pro Ala Leu Gln Arg Gly Asp Ser Val Tyr Leu Val
65 70 75 80

Gly Leu Ser Arg Asn Leu Gln Ala Thr Ser Arg Lys Ser Ile Val Thr
85 90 95

Asn Pro Cys Ala Ala Leu Asn Ile Gly Ser Ala Asp Ser Pro Arg Tyr
100 105 110

Arg Ala Thr Asn Met Glu Val Ile Glu Leu Asp Thr Asp Phe Gly Ser
115 120 125

Ser Phe Ser Gly Ala Leu Thr Asp Glu Gln Gly Arg Ile Arg Ala Ile
130 135 140

Trp Gly Ser Phe Ser Thr Gln Val Lys Tyr Ser Ser Thr Ser Ser Glu
145 150 155 160

Asp His Gln Phe Val Arg Gly Ile Pro Val Tyr Ala Ile Ser Gln Val
165 170 175

Leu Glu Lys Ile Ile Thr Gly Gly Asn Gly Pro Ala Leu Leu Ile Asn
180 185 190

Gly Val Lys Arg Pro Met Pro Leu Val Arg Ile Leu Glu Val Glu Leu
195 200 205

Tyr Pro Thr Leu Leu Ser Lys Ala Arg Ser Phe Gly Leu Ser Asp Glu
210 215 220

Trp Ile Gln Val Leu Val Lys Lys Asp Pro Val Arg Arg Gln Val Leu
225 230 235 240

Arg Val Lys Gly Cys Leu Ala Gly Ser Lys Ala Glu Asn Leu Leu Glu
245 250 255

Gln Gly Asp Met Val Leu Ala Val Asn Lys Met Pro Val Thr Cys Phe
260 265 270

Asn Asp Ile Glu Ala Ala Cys Gln Thr Leu Asp Lys Gly Ser Tyr Ser
275 280 285

Asp Glu Asn Leu Asn Leu Thr Ile Leu Arg Gln Gly Gln Glu Leu Glu
 290 295 300

Leu Val Val Gly Thr Asp Lys Arg Asp Gly Asn Gly Thr Thr Arg Val
 305 310 315 320

Ile Asn Trp Cys Gly Cys Val Val Gln Asp Pro His Pro Ala Val Arg
 325 330 335

Ala Leu Gly Phe Leu Pro Glu Glu Gly His Gly Val Tyr Val Thr Arg
 340 345 350

Trp Cys His Gly Ser Pro Ala His Arg Tyr Gly Leu Tyr Ala Leu Gln
 355 360 365

Trp Ile Val Glu Val Asn Gly Lys Lys Thr Pro Asp Leu Asn Ala Phe
 370 375 380

Ala Asp Ala Thr Lys Glu Leu Glu His Gly Gln Phe Val Arg Ile Arg
 385 390 395 400

Thr Val His Leu Asn Gly Lys Pro Arg Val Leu Thr Leu Lys Gln Asp
 405 410 415

Leu His Tyr Trp Pro Thr Trp Glu Leu Arg Phe Asp Pro Glu Thr Ala
 420 425 430

Leu Trp Arg Arg Asn Ile Leu Lys Ala Leu Gln
 435 440

<210> 13

<211> 312

<212> DNA

<213> Arabidopsis thaliana

<400> 13

atggcggttca cggcgcttgt gttcattgtg ttcgtggtgg gtgtcatggt ttctccagtt 60

tcaatcagag caactgaggt caaactttct ggaggagaag ctgatgtaac gtgtgatgca 120

gtacagctta gttcatgctc aacaccaatg ctacacaggag taccaccgtc tacagagtgt 180

tgcgggaaac tgaaggagca acagccgtgt ttttgtacat atattaaaga tccaagatat 240

agtcaatatg ttggttctgc aaatgctaag aaaacgtag caacttgtgg tggttccttat 300

cctacttggt ga

312

<210> 14
 <211> 103
 <212> PRT
 <213> Arabidopsis thaliana

<400> 14
 Met Ala Phe Thr Ala Leu Val Phe Ile Val Phe Val Val Gly Val Met
 1 5 10 15

Val Ser Pro Val Ser Ile Arg Ala Thr Glu Val Lys Leu Ser Gly Gly
 20 25 30

Glu Ala Asp Val Thr Cys Asp Ala Val Gln Leu Ser Ser Cys Ala Thr
 35 40 45

Pro Met Leu Thr Gly Val Pro Pro Ser Thr Glu Cys Cys Gly Lys Leu
 50 55 60

Lys Glu Gln Gln Pro Cys Phe Cys Thr Tyr Ile Lys Asp Pro Arg Tyr
 65 70 75 80

Ser Gln Tyr Val Gly Ser Ala Asn Ala Lys Lys Thr Leu Ala Thr Cys
 85 90 95

Gly Val Pro Tyr Pro Thr Cys
 100

<210> 15
 <211> 660
 <212> DNA
 <213> Arabidopsis thaliana

<400> 15
 atggcccttg atgagcttct caagactgtc ttgccaccag ctgaggaagg gcttggtcgt 60
 cagggaagct tgacgttacc tcgagatctc agtaaaaaga cagttgatga ggtctggaga 120
 gatatccaac aggacaagaa tggaaacggt actagtacta ctactactca taagcagcct 180
 acactcggtg aaataacact tgaggatttg ttgttgagag ctggtgtagt gactgagaca 240
 gtagtccctc aagaaaatgt tgtaacata gcttcaaagt ggcaatgggt tgagtatcat 300
 catcagcctc aacaacaaca agggtttatg acatatccgg tttgcgagat gcaagatatg 360
 gtgatgatgg gtggattatc ggatacacca caagcgcctg ggaggaaaag agtagctgga 420
 gagattgtgg agaagactgt tgagaggaga cagaagagga tgatcaagaa cagagaatct 480

gcagcacgtt cactgagctag gaaacaggct tatacacatg aattagagat caagggtttca 540
 aggttagaag aagaaaacga aaaacttcgg aggctaaagg aggtggagaa gacccctacca 600
 agtgaaccac caccagatcc taagtgggaag ctccggcgaa caaactctgc ttctctctga 660

<210> 16

<211> 219

<212> PRT

<213> Arabidopsis thaliana

<400> 16

Met Ala Leu Asp Glu Leu Leu Lys Thr Val Leu Pro Pro Ala Glu Glu
 1 5 10 15

Gly Leu Val Arg Gln Gly Ser Leu Thr Leu Pro Arg Asp Leu Ser Lys
 20 25 30

Lys Thr Val Asp Glu Val Trp Arg Asp Ile Gln Gln Asp Lys Asn Gly
 35 40 45

Asn Gly Thr Ser Thr Thr Thr Thr His Lys Gln Pro Thr Leu Gly Glu
 50 55 60

Ile Thr Leu Glu Asp Leu Leu Leu Arg Ala Gly Val Val Thr Glu Thr
 65 70 75 80

Val Val Pro Gln Glu Asn Val Val Asn Ile Ala Ser Asn Gly Gln Trp
 85 90 95

Val Glu Tyr His His Gln Pro Gln Gln Gln Gly Phe Met Thr Tyr
 100 105 110

Pro Val Cys Glu Met Gln Asp Met Val Met Met Gly Gly Leu Ser Asp
 115 120 125

Thr Pro Gln Ala Pro Gly Arg Lys Arg Val Ala Gly Glu Ile Val Glu
 130 135 140

Lys Thr Val Glu Arg Arg Gln Lys Arg Met Ile Lys Asn Arg Glu Ser
 145 150 155 160

Ala Ala Arg Ser Arg Ala Arg Lys Gln Ala Tyr Thr His Glu Leu Glu
 165 170 175

15/121

Ile Lys Val Ser Arg Leu Glu Glu Glu Asn Glu Lys Leu Arg Arg Leu
180 185 190

Lys Glu Val Glu Lys Ile Leu Pro Ser Glu Pro Pro Pro Asp Pro Lys
195 200 205

Trp Lys Leu Arg Arg Thr Asn Ser Ala Ser Leu
210 215

<210> 17
<211> 741
<212> DNA
<213> Arabidopsis thaliana

<400> 17
atggcgcaat cccgattatt agcgtttgct tcagcggcgc gttcacgtgt tcgaccaatc 60
gctcaaaggc gtttagcggtt tggatcatcc acgtctggtc gcacagctga tccagagatc 120
catgccggta acgatggagc cgatccagct atctatccga gagaccctga aggtatggat 180
gatgttgcaa accctaaaac ggcgggcgaa gaaatcgtag acgatactcc ccgaccgagt 240
ttagaagagc aaccgcttgt accgcccga tctccacgcg ccactgcgca caagctagag 300
agtactcccg ttggtcaccg gtcagaacct catttccaac agaaacgaaa aaactccacc 360
gcttctccgc cgtcgcttga ttccgtgagc tgtgctgggt tagacgggtc accatggccg 420
agagacgaag gagaagtgga agagcaaagg cgaagagaag atgaaacaga gagtgaccaa 480
gagttttaca aacaccacaa agcttctccg ttatcggaga ttgaattcgc cgatactcgg 540
aaacctatta cgcaagctac cgatggaact gcctaccag ccgggaaaga tgtgatcgga 600
tggttaccgg agcagctaga cacggcggaa gaatctttga tgaaagcaac aatgatattc 660
aaacgcaacg cagaacgtgg cgatcctgaa acgtttcctc attctagaat cttaaagagaa 720
atgagaggcg agtggtttta a 741

<210> 18
<211> 246
<212> PRT
<213> Arabidopsis thaliana

<400> 18
Met Ala Gln Ser Arg Leu Leu Ala Phe Ala Ser Ala Ala Arg Ser Arg
1 5 10 15

Val Arg Pro Ile Ala Gln Arg Arg Leu Ala Phe Gly Ser Ser Thr Ser
20 25 30

16/121

Gly Arg Thr Ala Asp Pro Glu Ile His Ala Gly Asn Asp Gly Ala Asp
35 40 45

Pro Ala Ile Tyr Pro Arg Asp Pro Glu Gly Met Asp Asp Val Ala Asn
50 55 60

Pro Lys Thr Ala Ala Glu Glu Ile Val Asp Asp Thr Pro Arg Pro Ser
65 70 75 80

Leu Glu Glu Gln Pro Leu Val Pro Pro Lys Ser Pro Arg Ala Thr Ala
85 90 95

His Lys Leu Glu Ser Thr Pro Val Gly His Pro Ser Glu Pro His Phe
100 105 110

Gln Gln Lys Arg Lys Asn Ser Thr Ala Ser Pro Pro Ser Leu Asp Ser
115 120 125

Val Ser Cys Ala Gly Leu Asp Gly Ser Pro Trp Pro Arg Asp Glu Gly
130 135 140

Glu Val Glu Glu Gln Arg Arg Arg Glu Asp Glu Thr Glu Ser Asp Gln
145 150 155 160

Glu Phe Tyr Lys His His Lys Ala Ser Pro Leu Ser Glu Ile Glu Phe
165 170 175

Ala Asp Thr Arg Lys Pro Ile Thr Gln Ala Thr Asp Gly Thr Ala Tyr
180 185 190

Pro Ala Gly Lys Asp Val Ile Gly Trp Leu Pro Glu Gln Leu Asp Thr
195 200 205

Ala Glu Glu Ser Leu Met Lys Ala Thr Met Ile Phe Lys Arg Asn Ala
210 215 220

Glu Arg Gly Asp Pro Glu Thr Phe Pro His Ser Arg Ile Leu Arg Glu
225 230 235 240

Met Arg Gly Glu Trp Phe
245

<210> 19
 <211> 1425
 <212> DNA
 <213> *Arabidopsis thaliana*

<400> 19
 atgtccgtgg ctcgattcga tttctcttgg tgcgatgctg attatcacca ggagacgctg 60
 gagaatctga agatagctgt gaagagcact aagaagcttt gtgctgttat gctagacact 120
 gtaggacctg agttgcaagt tattaacaag actgagaaag ctatttctct taaagctgat 180
 ggccttgtaa ctttgactcc gagtcaagat caagaagcct cctctgaagt ccttccatt 240
 aattttgatg ggtagcgaa ggcgggtaag aaaggagaca ctatctttgt tggacaatac 300
 ctcttcactg gtagtgaaac aacttcagtt tggcttgagg ttgaagaagt taaaggagat 360
 gatgtcattt gtatttcaag gaatgctgct actctgggtg gtccgttatt cacattgcac 420
 gtctctcaag ttcacattga tatgccaaacc ctaactgaga aggataagga ggtataagt 480
 acatggggag ttcagaataa gatcgacttt ctctcattat cttattgtcg acatgcagaa 540
 gatgttcgcc aggcccgta gttgcttaac agttgtggtg acctctctca aacacaaata 600
 tttgcaaga ttgagaatga agagggacta acccactttg acgaaattct acaagaagca 660
 gatggcatta ttctttctcg tgggaatttg ggtatcgatc tacctccgga aaagggtgtt 720
 ttgttccaaa aggctgctct ttacaagtgt aacatggctg gaaagcctgc cgttcttact 780
 cgtgtttag acagtatgac agacaatctg cggccaactc gtgcagaggc aactgatgtt 840
 gctaattgctg ttttagatgg aagtgatgca attcttcttg gtgctgagac tcttcgtgga 900
 ttgtaccctg ttgaaaccat atcaactgtt ggtagaatct gttgtgaggc agagaaagtt 960
 ttcaaccaag atttgttctt taagaagact gtcaagtatg ttggagaacc aatgactcac 1020
 ttggaatcta ttgcttcttc tgctgtacgg gcagcaatca aggttaaggc atccgtaatt 1080
 atatgcttca cctcgtctgg cagagcagca aggttgattg ccaaataccg tccaactatg 1140
 cccgttctct ctggtgtcat tccccgactt acgacaaatc agctgaagtg gagctttagc 1200
 ggagcccttg aggcaaggca gtcacttatt gtcagaggtc ttttcccat gcttgctgat 1260
 cctcgtcacc ctgcggaatc aacaagtgca acaaatgagt cggttcttaa agtggctcta 1320
 gaccatggga agcaagccgg agtgatcaag tcacatgaca gagttgtggt ctgtcagaaa 1380
 gtgggagatg cgtccgtggt caaaatcacc gagctagagg attag 1425

<210> 20
 <211> 474

18/121

<212> PRT

<213> Arabidopsis thaliana

<400> 20

Met Ser Val Ala Arg Phe Asp Phe Ser Trp Cys Asp Ala Asp Tyr His
1 5 10 15

Gln Glu Thr Leu Glu Asn Leu Lys Ile Ala Val Lys Ser Thr Lys Lys
20 25 30

Leu Cys Ala Val Met Leu Asp Thr Val Gly Pro Glu Leu Gln Val Ile
35 40 45

Asn Lys Thr Glu Lys Ala Ile Ser Leu Lys Ala Asp Gly Leu Val Thr
50 55 60

Leu Thr Pro Ser Gln Asp Gln Glu Ala Ser Ser Glu Val Leu Pro Ile
65 70 75 80

Asn Phe Asp Gly Leu Ala Lys Ala Val Lys Lys Gly Asp Thr Ile Phe
85 90 95

Val Gly Gln Tyr Leu Phe Thr Gly Ser Glu Thr Thr Ser Val Trp Leu
100 105 110

Glu Val Glu Glu Val Lys Gly Asp Asp Val Ile Cys Ile Ser Arg Asn
115 120 125

Ala Ala Thr Leu Gly Gly Pro Leu Phe Thr Leu His Val Ser Gln Val
130 135 140

His Ile Asp Met Pro Thr Leu Thr Glu Lys Asp Lys Glu Val Ile Ser
145 150 155 160

Thr Trp Gly Val Gln Asn Lys Ile Asp Phe Leu Ser Leu Ser Tyr Cys
165 170 175

Arg His Ala Glu Asp Val Arg Gln Ala Arg Glu Leu Leu Asn Ser Cys
180 185 190

Gly Asp Leu Ser Gln Thr Gln Ile Phe Ala Lys Ile Glu Asn Glu Glu
195 200 205

Gly Leu Thr His Phe Asp Glu Ile Leu Gln Glu Ala Asp Gly Ile Ile
210 215 220

Leu Ser Arg Gly Asn Leu Gly Ile Asp Leu Pro Pro Glu Lys Val Phe
 225 230 235 240

Leu Phe Gln Lys Ala Ala Leu Tyr Lys Cys Asn Met Ala Gly Lys Pro
 245 250 255

Ala Val Leu Thr Arg Val Val Asp Ser Met Thr Asp Asn Leu Arg Pro
 260 265 270

Thr Arg Ala Glu Ala Thr Asp Val Ala Asn Ala Val Leu Asp Gly Ser
 275 280 285

Asp Ala Ile Leu Leu Gly Ala Glu Thr Leu Arg Gly Leu Tyr Pro Val
 290 295 300

Glu Thr Ile Ser Thr Val Gly Arg Ile Cys Cys Glu Ala Glu Lys Val
 305 310 315 320

Phe Asn Gln Asp Leu Phe Phe Lys Lys Thr Val Lys Tyr Val Gly Glu
 325 330 335

Pro Met Thr His Leu Glu Ser Ile Ala Ser Ser Ala Val Arg Ala Ala
 340 345 350

Ile Lys Val Lys Ala Ser Val Ile Ile Cys Phe Thr Ser Ser Gly Arg
 355 360 365

Ala Ala Arg Leu Ile Ala Lys Tyr Arg Pro Thr Met Pro Val Leu Ser
 370 375 380

Val Val Ile Pro Arg Leu Thr Thr Asn Gln Leu Lys Trp Ser Phe Ser
 385 390 395 400

Gly Ala Phe Glu Ala Arg Gln Ser Leu Ile Val Arg Gly Leu Phe Pro
 405 410 415

Met Leu Ala Asp Pro Arg His Pro Ala Glu Ser Thr Ser Ala Thr Asn
 420 425 430

Glu Ser Val Leu Lys Val Ala Leu Asp His Gly Lys Gln Ala Gly Val
 435 440 445

20/121

Ile Lys Ser His Asp Arg Val Val Val Cys Gln Lys Val Gly Asp Ala
450 455 460

Ser Val Val Lys Ile Ile Glu Leu Glu Asp
465 470

<210> 21

<211> 936

<212> DNA

<213> Arabidopsis thaliana

<400> 21

```
atggcgattt acagatctct aagaaagcta gttgaaatca atcaccggaa aacaagacca      60
ttcttcaccg ccgctacagc ttccggcgga accgtttctc tgactccacc gcagttttcg      120
ccgttggtcc cacatttctc acaccgttta tctccgcttt cgaaatgggt cgttctctct      180
aatggacctc tcttcttctc ttctctctct tggaaacttc tccagtctgc gacacctttg      240
cactggcgcg gaaacggctc tgttttgaaa aaagtcgaag ctctgaatct tagattggat      300
cgaattagaa gcagaactag gtttccgaga cagttagggt tacagtctgt ggtaccaaac      360
atattgacgg tggatcgcaa cgattccaag gaagaagatg gtggaaaatt agtcaagagt      420
tttggttaat tgccgaatat gatatcaatg gcgagattag tatctgggtc tgtgcttttg      480
tggatgatct cgaatgagat gtattcttct gctttcttag ggttggctgt ttctggagct      540
agtgattggt tagatgggta cgtggctcgg aggatgaaga ttaactctgt ggttggctcg      600
taccttgatc ctcttgaga caagggtctt atcgggtgtg tagcagtagc aatggtgcag      660
aaggatctct tacatcctgg actggttgga attgtgttgt tacgggatgt tgcactcgtt      720
ggtggtgcag ttacctaag ggcactaaac ttggactgga ggtggaaaac ttggagtgcag      780
ttcttcaatc tagatgggtc aagtcctcag aaagtagaac cattgtttat aagcaagggt      840
aatacagttt tccagttgac tctagtcgct ggtgcaatac ttcaaccaga gtttggaat      900
ccagacaccc agacatggat cacttatcta aggttaa      936
```

<210> 22

<211> 311

<212> PRT

<213> Arabidopsis thaliana

<400> 22

Met Ala Ile Tyr Arg Ser Leu Arg Lys Leu Val Glu Ile Asn His Arg
1 5 10 15

21/121

Lys Thr Arg Pro Phe Leu Thr Ala Ala Thr Ala Ser Gly Gly Thr Val
20 25 30

Ser Leu Thr Pro Pro Gln Phe Ser Pro Leu Phe Pro His Phe Ser His
35 40 45

Arg Leu Ser Pro Leu Ser Lys Trp Phe Val Pro Leu Asn Gly Pro Leu
50 55 60

Phe Leu Ser Ser Pro Pro Trp Lys Leu Leu Gln Ser Ala Thr Pro Leu
65 70 75 80

His Trp Arg Gly Asn Gly Ser Val Leu Lys Lys Val Glu Ala Leu Asn
85 90 95

Leu Arg Leu Asp Arg Ile Arg Ser Arg Thr Arg Phe Pro Arg Gln Leu
100 105 110

Gly Leu Gln Ser Val Val Pro Asn Ile Leu Thr Val Asp Arg Asn Asp
115 120 125

Ser Lys Glu Glu Asp Gly Gly Lys Leu Val Lys Ser Phe Val Asn Val
130 135 140

Pro Asn Met Ile Ser Met Ala Arg Leu Val Ser Gly Pro Val Leu Trp
145 150 155 160

Trp Met Ile Ser Asn Glu Met Tyr Ser Ser Ala Phe Leu Gly Leu Ala
165 170 175

Val Ser Gly Ala Ser Asp Trp Leu Asp Gly Tyr Val Ala Arg Arg Met
180 185 190

Lys Ile Asn Ser Val Val Gly Ser Tyr Leu Asp Pro Leu Ala Asp Lys
195 200 205

Val Leu Ile Gly Cys Val Ala Val Ala Met Val Gln Lys Asp Leu Leu
210 215 220

His Pro Gly Leu Val Gly Ile Val Leu Leu Arg Asp Val Ala Leu Val
225 230 235 240

Gly Gly Ala Val Tyr Leu Arg Ala Leu Asn Leu Asp Trp Arg Trp Lys
245 250 255

Thr Trp Ser Asp Phe Phe Asn Leu Asp Gly Ser Ser Pro Gln Lys Val
 260 265 270

Glu Pro Leu Phe Ile Ser Lys Val Asn Thr Val Phe Gln Leu Thr Leu
 275 280 285

Val Ala Gly Ala Ile Leu Gln Pro Glu Phe Gly Asn Pro Asp Thr Gln
 290 295 300

Thr Trp Ile Thr Tyr Leu Arg
 305 310

<210> 23

<211> 2427

<212> DNA

<213> Arabidopsis thaliana

<400> 23

atggtaaagg aaactctaatt tctccgtca tctacgtcaa tgacgaccgg aacatcttct	60
tcttcgtctc tttcaatgac gttatcctca acaaacgcgt tatcgttttt gtcgaaagga	120
tggagagagg tatgggattc agcagatgcg gatttgcagc tgatgcgaga cagagctaac	180
tctgttaaga atctagcatc aacgttcgat agagagatcg agaatttcct caataactcg	240
gcgaggtctg cgtttcccggt tggttcacca tcggcgctcgt ctttctcaaa tgaaattgggt	300
atcatgaaga agcttcagcc gaagatttcg gagtttcgta gggtttattc ggcgccggag	360
attagtcgca aggttatgga gagatgggga cctgcgagag cgaagcttgg aatggatcta	420
tcggcgatta agaaggcgat tgtgtctgag atggaattgg atgagcgtca gggagttttg	480
gagatgagta gattgaggag acggcgtaat agtgataggg ttaggtttac ggagtttttc	540
gcggaggctg agagagatgg agaagcttat ttcggtgatt gggaaccgat taggtctttg	600
aagagtagat ttaaagagtt tgagaaacga agctcgttag aaatattgag tggattcaag	660
aacagtgaat ttgttgagaa gctcaaaacc agctttaaat caatttacia agaaactgat	720
gaggctaagg atgtccctcc gttggatgta cctgaactgt tggcatgttt ggtagacaa	780
tctgaacctt ttcttgatca gattggtggt agaaaggata catgtgaccg aatagtagaa	840
agcctttgca aatgcaagag ccaacaactt tggcgtctgc catctgcaca agcatccgat	900
ttaattgaaa atgataacca tggagttgat ttggatatga ggatagccag tgttcttcaa	960
agcacaggac accattatga tgggtgggttt tggactgatt ttgtgaagcc tgagacaccg	1020

```

gaaaacaaaa ggcattgtggc aattgtttaca acagctagtc ttccttggat gaccggaaca 1080
gctgtaaaatc cgctatttcag agcggcggtat ttggcaaaaag ctgcaaaaaca gagtggttact 1140
ctcgtgggttc cttgggtctg cgaatctgat caagaactag tgtatccaaa caatctcacc 1200
ttcagctcac ctgaagaaca agagagttat atacgtaaat gggtggagga aaggattggt 1260
ttcaaggctg attttaaaat ctccttttac ccaggaaagt tttcaaaaga aaggcgagc 1320
atatttcctg ctggtgacac ttctcaattt atatcgtaa aagatgctga cattgctata 1380
cttgaagaac ctgaacatct caactgggtat tatcacggca agcgttggac tgataaattc 1440
aaccatgttg ttggaattgt ccacacaaac tacttagagt acatcaagag ggagaagaat 1500
ggagctcttc aagcattttt tgtgaacct gtaacaatt gggtcacacg agcgtattgt 1560
gacaagggtc ttcgcctctc tgcggcaaca caagatttac caaagtctgt tgtatgcaat 1620
gtccatgggt tcaatcccaa gttccttatg attggggaga aaattgctga agagagatcc 1680
cgtggtgaac aagctttctc aaaagggtgca tacttcttag gaaaaatggt gtgggctaaa 1740
ggatacagag aactaataga tctgatggct aaacacaaaa gcgaacttgg gagcttcaat 1800
ctagatgtat atgggaacgg tgaagatgca gtcgaggtcc aacgtgcagc aaagaaacat 1860
gacttgaatc tcaatttcct caaaggaagg gaccacgctg acgatgctct tcacaagtac 1920
aaagtgttca taaaccccag catcagcgat gttctatgca cagcaaccgc agaagcacta 1980
gccatgggga agtttgtggt gtgtgcagat cacccttcaa acgaattctt tagatcattc 2040
ccgaactgct taacttaca aacatccgaa gactttgtgt ccaaagtgca agaagcaatg 2100
acgaaagagc cactacctct cactcctgaa caaatgtaca atctctcttg ggaagcagca 2160
acacagaggt tcatggagta ttcagatctc gataagatct taaacaatgg agagggagga 2220
aggaagatgc gaaaatcaag atcggttccg agctttaacg aggtggtcga tggaggattg 2280
gcattctcac actatgttct aacagggaac gatttcttga gactatgcac tggagcaaca 2340
ccaagaacaa aagactatga taatcaacat tgcaaggatc tgaatctcgt accacctcac 2400
gttcacaagc caatcttcgg ctggtag 2427

```

<210> 24

<211> 808

<212> PRT

<213> *Arabidopsis thaliana*

<400> 24

```

Met Val Lys Glu Thr Leu Ile Pro Pro Ser Ser Thr Ser Met Thr Thr
1           5           10           15

```


Gly Thr Ser Ser Ser Ser Ser Leu Ser Met Thr Leu Ser Ser Thr Asn
 20 25 30

Ala Leu Ser Phe Leu Ser Lys Gly Trp Arg Glu Val Trp Asp Ser Ala
 35 40 45

Asp Ala Asp Leu Gln Leu Met Arg Asp Arg Ala Asn Ser Val Lys Asn
 50 55 60

Leu Ala Ser Thr Phe Asp Arg Glu Ile Glu Asn Phe Leu Asn Asn Ser
 65 70 75 80

Ala Arg Ser Ala Phe Pro Val Gly Ser Pro Ser Ala Ser Ser Phe Ser
 85 90 95

Asn Glu Ile Gly Ile Met Lys Lys Leu Gln Pro Lys Ile Ser Glu Phe
 100 105 110

Arg Arg Val Tyr Ser Ala Pro Glu Ile Ser Arg Lys Val Met Glu Arg
 115 120 125

Trp Gly Pro Ala Arg Ala Lys Leu Gly Met Asp Leu Ser Ala Ile Lys
 130 135 140

Lys Ala Ile Val Ser Glu Met Glu Leu Asp Glu Arg Gln Gly Val Leu
 145 150 155 160

Glu Met Ser Arg Leu Arg Arg Arg Arg Asn Ser Asp Arg Val Arg Phe
 165 170 175

Thr Glu Phe Phe Ala Glu Ala Glu Arg Asp Gly Glu Ala Tyr Phe Gly
 180 185 190

Asp Trp Glu Pro Ile Arg Ser Leu Lys Ser Arg Phe Lys Glu Phe Glu
 195 200 205

Lys Arg Ser Ser Leu Glu Ile Leu Ser Gly Phe Lys Asn Ser Glu Phe
 210 215 220

Val Glu Lys Leu Lys Thr Ser Phe Lys Ser Ile Tyr Lys Glu Thr Asp
 225 230 235 240

25/121

Glu Ala Lys Asp Val Pro Pro Leu Asp Val Pro Glu Leu Leu Ala Cys
245 250 255

Leu Val Arg Gln Ser Glu Pro Phe Leu Asp Gln Ile Gly Val Arg Lys
260 265 270

Asp Thr Cys Asp Arg Ile Val Glu Ser Leu Cys Lys Cys Lys Ser Gln
275 280 285

Gln Leu Trp Arg Leu Pro Ser Ala Gln Ala Ser Asp Leu Ile Glu Asn
290 295 300

Asp Asn His Gly Val Asp Leu Asp Met Arg Ile Ala Ser Val Leu Gln
305 310 315 320

Ser Thr Gly His His Tyr Asp Gly Gly Phe Trp Thr Asp Phe Val Lys
325 330 335

Pro Glu Thr Pro Glu Asn Lys Arg His Val Ala Ile Val Thr Thr Ala
340 345 350

Ser Leu Pro Trp Met Thr Gly Thr Ala Val Asn Pro Leu Phe Arg Ala
355 360 365

Ala Tyr Leu Ala Lys Ala Ala Lys Gln Ser Val Thr Leu Val Val Pro
370 375 380

Trp Leu Cys Glu Ser Asp Gln Glu Leu Val Tyr Pro Asn Asn Leu Thr
385 390 395 400

Phe Ser Ser Pro Glu Glu Gln Glu Ser Tyr Ile Arg Lys Trp Leu Glu
405 410 415

Glu Arg Ile Gly Phe Lys Ala Asp Phe Lys Ile Ser Phe Tyr Pro Gly
420 425 430

Lys Phe Ser Lys Glu Arg Arg Ser Ile Phe Pro Ala Gly Asp Thr Ser
435 440 445

Gln Phe Ile Ser Ser Lys Asp Ala Asp Ile Ala Ile Leu Glu Glu Pro
450 455 460

Glu His Leu Asn Trp Tyr Tyr His Gly Lys Arg Trp Thr Asp Lys Phe
465 470 475 480

Asn His Val Val Gly Ile Val His Thr Asn Tyr Leu Glu Tyr Ile Lys
 485 490 495

Arg Glu Lys Asn Gly Ala Leu Gln Ala Phe Phe Val Asn His Val Asn
 500 505 510

Asn Trp Val Thr Arg Ala Tyr Cys Asp Lys Val Leu Arg Leu Ser Ala
 515 520 525

Ala Thr Gln Asp Leu Pro Lys Ser Val Val Cys Asn Val His Gly Val
 530 535 540

Asn Pro Lys Phe Leu Met Ile Gly Glu Lys Ile Ala Glu Glu Arg Ser
 545 550 555 560

Arg Gly Glu Gln Ala Phe Ser Lys Gly Ala Tyr Phe Leu Gly Lys Met
 565 570 575

Val Trp Ala Lys Gly Tyr Arg Glu Leu Ile Asp Leu Met Ala Lys His
 580 585 590

Lys Ser Glu Leu Gly Ser Phe Asn Leu Asp Val Tyr Gly Asn Gly Glu
 595 600 605

Asp Ala Val Glu Val Gln Arg Ala Ala Lys Lys His Asp Leu Asn Leu
 610 615 620

Asn Phe Leu Lys Gly Arg Asp His Ala Asp Asp Ala Leu His Lys Tyr
 625 630 635 640

Lys Val Phe Ile Asn Pro Ser Ile Ser Asp Val Leu Cys Thr Ala Thr
 645 650 655

Ala Glu Ala Leu Ala Met Gly Lys Phe Val Val Cys Ala Asp His Pro
 660 665 670

Ser Asn Glu Phe Phe Arg Ser Phe Pro Asn Cys Leu Thr Tyr Lys Thr
 675 680 685

Ser Glu Asp Phe Val Ser Lys Val Gln Glu Ala Met Thr Lys Glu Pro
 690 695 700

27/121

Leu Pro Leu Thr Pro Glu Gln Met Tyr Asn Leu Ser Trp Glu Ala Ala
705 710 715 720

Thr Gln Arg Phe Met Glu Tyr Ser Asp Leu Asp Lys Ile Leu Asn Asn
725 730 735

Gly Glu Gly Gly Arg Lys Met Arg Lys Ser Arg Ser Val Pro Ser Phe
740 745 750

Asn Glu Val Val Asp Gly Gly Leu Ala Phe Ser His Tyr Val Leu Thr
755 760 765

Gly Asn Asp Phe Leu Arg Leu Cys Thr Gly Ala Thr Pro Arg Thr Lys
770 775 780

Asp Tyr Asp Asn Gln His Cys Lys Asp Leu Asn Leu Val Pro Pro His
785 790 795 800

Val His Lys Pro Ile Phe Gly Trp
805

<210> 25

<211> 1176

<212> DNA

<213> Arabidopsis thaliana

<400> 25

```
atggcgactt ttgctgaact tgttttatcg acttctcgct gtacatgccc ttgccgttca 60
ttcactagaa aaccctaata tcgtccccct ttatctggtc tgcgtctccc cggtgatacc 120
aaaccattgt ttcgttccgg acttggtcgg atttctgtta gccggcgttt cctcacggcc 180
gttgctcgag ctgaatcaga ccagcttggt gatgatgacc actcaaaggg aattgataga 240
atccataact tgcagaatgt ggaagataag cagaagaaag caagccagct taagaaaaga 300
gtgatctttg gtattggcat tggtttacct gttggatgtg ttgtgttagc tggaggatgg 360
gttttcactg tagcttttagc atcttctgtt tttatcggtt cccgcgaata tttcgagctt 420
gttagaagta gaggcatagc taaaggaatg actcctctc cagcatatgt atctcgagtt 480
tgctcgggta tatgtgccct tatgcccata cttacactgt actttggtaa cattgatata 540
ttggtgacat ctgcagcatt tgttggtgca atagcattgt tagtaciaaag aggatcccca 600
cgttttgctc agctgagtag tacaatgttt ggtctgtttt actgtgggta tctcccttct 660
ttctggggtta agcttcgctg tggtttagct gtcctgcgc ttaacactgg tatcggaagg 720
```

28/121

acatggccaa ttcttcttgg tggtaagct cattggacag ttggacttgt ggcaacattg 780
 atttctttca gcggtgtaat tgcgacagac acatttgctt ttctcggtgg aaagactttt 840
 ggtaggacac ctcttactag tattagtccc aagaagacat gggaaggaaac tattgtagga 900
 cttgttggtt gtatagccat taccatatta ctctctaaat atctcagttg gccacaatct 960
 ctgttcagct cagtagcttt tgggtttctt aacttctttg ggtcagtctt tggatgattt 1020
 actgaatcaa tgatcaagcg tgatgctggc gtcaaagact ctgggttcact tatcccagga 1080
 cacgggtggaa tattagatag agttgatagt tacattttca ccggcgcatt agcttattca 1140
 ttcatcaaaa catccctaaa actttacgga gtttga 1176

<210> 26

<211> 391

<212> PRT

<213> Arabidopsis thaliana

<400> 26

Met Ala Thr Phe Ala Glu Leu Val Leu Ser Thr Ser Arg Cys Thr Cys
 1 5 10 15

Pro Cys Arg Ser Phe Thr Arg Lys Pro Leu Ile Arg Pro Pro Leu Ser
 20 25 30

Gly Leu Arg Leu Pro Gly Asp Thr Lys Pro Leu Phe Arg Ser Gly Leu
 35 40 45

Gly Arg Ile Ser Val Ser Arg Arg Phe Leu Thr Ala Val Ala Arg Ala
 50 55 60

Glu Ser Asp Gln Leu Gly Asp Asp Asp His Ser Lys Gly Ile Asp Arg
 65 70 75 80

Ile His Asn Leu Gln Asn Val Glu Asp Lys Gln Lys Lys Ala Ser Gln
 85 90 95

Leu Lys Lys Arg Val Ile Phe Gly Ile Gly Ile Gly Leu Pro Val Gly
 100 105 110

Cys Val Val Leu Ala Gly Gly Trp Val Phe Thr Val Ala Leu Ala Ser
 115 120 125

Ser Val Phe Ile Gly Ser Arg Glu Tyr Phe Glu Leu Val Arg Ser Arg
 130 135 140

29/121

Gly Ile Ala Lys Gly Met Thr Pro Pro Pro Arg Tyr Val Ser Arg Val
145 150 155 160

Cys Ser Val Ile Cys Ala Leu Met Pro Ile Leu Thr Leu Tyr Phe Gly
165 170 175

Asn Ile Asp Ile Leu Val Thr Ser Ala Ala Phe Val Val Ala Ile Ala
180 185 190

Leu Leu Val Gln Arg Gly Ser Pro Arg Phe Ala Gln Leu Ser Ser Thr
195 200 205

Met Phe Gly Leu Phe Tyr Cys Gly Tyr Leu Pro Ser Phe Trp Val Lys
210 215 220

Leu Arg Cys Gly Leu Ala Ala Pro Ala Leu Asn Thr Gly Ile Gly Arg
225 230 235 240

Thr Trp Pro Ile Leu Leu Gly Gly Gln Ala His Trp Thr Val Gly Leu
245 250 255

Val Ala Thr Leu Ile Ser Phe Ser Gly Val Ile Ala Thr Asp Thr Phe
260 265 270

Ala Phe Leu Gly Gly Lys Thr Phe Gly Arg Thr Pro Leu Thr Ser Ile
275 280 285

Ser Pro Lys Lys Thr Trp Glu Gly Thr Ile Val Gly Leu Val Gly Cys
290 295 300

Ile Ala Ile Thr Ile Leu Leu Ser Lys Tyr Leu Ser Trp Pro Gln Ser
305 310 315 320

Leu Phe Ser Ser Val Ala Phe Gly Phe Leu Asn Phe Phe Gly Ser Val
325 330 335

Phe Gly Asp Leu Thr Glu Ser Met Ile Lys Arg Asp Ala Gly Val Lys
340 345 350

Asp Ser Gly Ser Leu Ile Pro Gly His Gly Gly Ile Leu Asp Arg Val
355 360 365

Asp Ser Tyr Ile Phe Thr Gly Ala Leu Ala Tyr Ser Phe Ile Lys Thr
 370 375 380

Ser Leu Lys Leu Tyr Gly Val
 385 390

<210> 27

<211> 798

<212> DNA

<213> Arabidopsis thaliana

<400> 27

atgggtcaaa ccatgctgct tacttcaggc gtcaccgccg gccatttttt gaggaacaag	60
agcccttttg ctcagcccaa agttcaccat ctcttcctct ctggaaactc tccggttgca	120
ctaccatcta ggagacaatc attcgttctt ctgctctct tcaaacccaa aaccaaagct	180
gctcctaaaa aggttgagaa gccgaagagc aaggttgagg atggcatctt tggaacgtct	240
ggtgggattg gtttcacaaa ggcgaatgag ctattcggtg gtcgtggtgc tatgatcggt	300
ttcgtgcat cgttgcttg tgaggcgttg acgggaaaag ggatattagc tcagctgaat	360
ctggagacag ggataccgat ttacgaagca gagccattgc ttctctctt catcttggtc	420
actctgttg gagccattgg agctctcgga gacagaggaa aattcgtcga cgatcctccc	480
accgggctcg agaaagccgt cattcctccc ggcaaaaacg tccgatctgc ctcgggtctc	540
aaagaacaag gtccattggt tgggttcacg aaggcgaacg agttattcgt aggaagattg	600
gcacagttgg gaatagcatt ttactgata ggagagatta ttaccgggaa aggagcatta	660
gctcaactca acattgagac cgttatacca attcaagata tcgaaccact tgtcctctta	720
aacgttgctt tcttctctt cgctgccatt aatcctggta atggaaaatt catcaccgat	780
gatggtgaag aaagctaa	798

<210> 28

<211> 265

<212> PRT

<213> Arabidopsis thaliana

<400> 28

Met Ala Gln Thr Met Leu Leu Thr Ser Gly Val Thr Ala Gly His Phe	
1 5 10 15	

Leu Arg Asn Lys Ser Pro Leu Ala Gln Pro Lys Val His His Leu Phe	
20 25 30	

31/121

Leu Ser Gly Asn Ser Pro Val Ala Leu Pro Ser Arg Arg Gln Ser Phe
35 40 45

Val Pro Leu Ala Leu Phe Lys Pro Lys Thr Lys Ala Ala Pro Lys Lys
50 55 60

Val Glu Lys Pro Lys Ser Lys Val Glu Asp Gly Ile Phe Gly Thr Ser
65 70 75 80

Gly Gly Ile Gly Phe Thr Lys Ala Asn Glu Leu Phe Val Gly Arg Val
85 90 95

Ala Met Ile Gly Phe Ala Ala Ser Leu Leu Gly Glu Ala Leu Thr Gly
100 105 110

Lys Gly Ile Leu Ala Gln Leu Asn Leu Glu Thr Gly Ile Pro Ile Tyr
115 120 125

Glu Ala Glu Pro Leu Leu Leu Phe Phe Ile Leu Phe Thr Leu Leu Gly
130 135 140

Ala Ile Gly Ala Leu Gly Asp Arg Gly Lys Phe Val Asp Asp Pro Pro
145 150 155 160

Thr Gly Leu Glu Lys Ala Val Ile Pro Pro Gly Lys Asn Val Arg Ser
165 170 175

Ala Leu Gly Leu Lys Glu Gln Gly Pro Leu Phe Gly Phe Thr Lys Ala
180 185 190

Asn Glu Leu Phe Val Gly Arg Leu Ala Gln Leu Gly Ile Ala Phe Ser
195 200 205

Leu Ile Gly Glu Ile Ile Thr Gly Lys Gly Ala Leu Ala Gln Leu Asn
210 215 220

Ile Glu Thr Gly Ile Pro Ile Gln Asp Ile Glu Pro Leu Val Leu Leu
225 230 235 240

Asn Val Ala Phe Phe Phe Phe Ala Ala Ile Asn Pro Gly Asn Gly Lys
245 250 255

Phe Ile Thr Asp Asp Gly Glu Glu Ser
260 265

<210> 29
 <211> 1152
 <212> DNA
 <213> *Arabidopsis thaliana*

<400> 29
 atgggtgcag gtggaagaat gccggttcct acttcttcca agaaatcgga aaccgacacc 60
 acaaagcgtg tgccgtgcga gaaaccgcct ttctcggtag gagatctgaa gaaagcaatc 120
 ccgccgcatt gtttcaaacg ctcaatccct cgtctttct cctaccttat cagtgcacac 180
 attatagcct catgcttcta ctacgtcgcc accaattact tctctctcct ccctcagcct 240
 ctctcttact tggcttgccc actctattgg gcctgtcaag gctgtgtcct aactgggtac 300
 tgggtcatag ccacgaatg cggtcaccac gcattcagcg actaccaatg gctggatgac 360
 acagttgggc ttatcttcca ttcttctc ctcgtccctt acttctcctg gaagtatagt 420
 catcgccgtc accattccaa cactggatcc ctcgaaagag atgaagtatt tgtcccaaag 480
 cagaaatcag caatcaagtg gtacgggaaa tacctcaaca accctcttgg acgcacatg 540
 atgttaaccg tccagtttgt cctcgggtgg cccttgtag tagcctttaa cgtctctggc 600
 agaccgtatg acgggttcgc ttgccatttc ttcccaacg ctcccatcta caatgaccga 660
 gaacgcctcc agatatacct ctctgatgcg ggtattctag ccgtctgttt tggctcttac 720
 cgttacgctg ctgcacaagg gatggcctcg atgatctgcc tctacggagt accgcttctg 780
 atagtgaatg cgttcctcgt cttgatcact tacttgcagc acactcatcc ctggttgcc 840
 cactacgatt catcagagtg ggaactggctc aggggagctt tggctaccgt agacagagac 900
 tacggaatct tgaacaaggt gttccacaac attacagaca cacacgtggc tcatcacctg 960
 ttctcgacaa tgccgcctta taacgcaatg gaagctacaa aggcgataaa gccaattctg 1020
 ggagactatt accagttcga tggaaacacc tggtagtag cgatgtatag ggaggcaaag 1080
 gagtgtatct atgtagaacc ggacagggaa ggtgacaaga aagggtgtga ctggtacaac 1140
 aataagttat ga 1152

<210> 30
 <211> 383
 <212> PRT
 <213> *Arabidopsis thaliana*

<400> 30
 Met Gly Ala Gly Gly Arg Met Pro Val Pro Thr Ser Ser Lys Lys Ser
 1 5 10 15

Glu Thr Asp Thr Thr Lys Arg Val Pro Cys Glu Lys Pro Pro Phe Ser
 20 25 30

Val Gly Asp Leu Lys Lys Ala Ile Pro Pro His Cys Phe Lys Arg Ser
 35 40 45

Ile Pro Arg Ser Phe Ser Tyr Leu Ile Ser Asp Ile Ile Ile Ala Ser
 50 55 60

Cys Phe Tyr Tyr Val Ala Thr Asn Tyr Phe Ser Leu Leu Pro Gln Pro
 65 70 75 80

Leu Ser Tyr Leu Ala Trp Pro Leu Tyr Trp Ala Cys Gln Gly Cys Val
 85 90 95

Leu Thr Gly Ile Trp Val Ile Ala His Glu Cys Gly His His Ala Phe
 100 105 110

Ser Asp Tyr Gln Trp Leu Asp Asp Thr Val Gly Leu Ile Phe His Ser
 115 120 125

Phe Leu Leu Val Pro Tyr Phe Ser Trp Lys Tyr Ser His Arg Arg His
 130 135 140

His Ser Asn Thr Gly Ser Leu Glu Arg Asp Glu Val Phe Val Pro Lys
 145 150 155 160

Gln Lys Ser Ala Ile Lys Trp Tyr Gly Lys Tyr Leu Asn Asn Pro Leu
 165 170 175

Gly Arg Ile Met Met Leu Thr Val Gln Phe Val Leu Gly Trp Pro Leu
 180 185 190

Tyr Leu Ala Phe Asn Val Ser Gly Arg Pro Tyr Asp Gly Phe Ala Cys
 195 200 205

His Phe Phe Pro Asn Ala Pro Ile Tyr Asn Asp Arg Glu Arg Leu Gln
 210 215 220

Ile Tyr Leu Ser Asp Ala Gly Ile Leu Ala Val Cys Phe Gly Leu Tyr
 225 230 235 240

34/121

Arg Tyr Ala Ala Ala Gln Gly Met Ala Ser Met Ile Cys Leu Tyr Gly
245 250 255

Val Pro Leu Leu Ile Val Asn Ala Phe Leu Val Leu Ile Thr Tyr Leu
260 265 270

Gln His Thr His Pro Ser Leu Pro His Tyr Asp Ser Ser Glu Trp Asp
275 280 285

Trp Leu Arg Gly Ala Leu Ala Thr Val Asp Arg Asp Tyr Gly Ile Leu
290 295 300

Asn Lys Val Phe His Asn Ile Thr Asp Thr His Val Ala His His Leu
305 310 315 320

Phe Ser Thr Met Pro Pro Tyr Asn Ala Met Glu Ala Thr Lys Ala Ile
325 330 335

Lys Pro Ile Leu Gly Asp Tyr Tyr Gln Phe Asp Gly Thr Pro Trp Tyr
340 345 350

Val Ala Met Tyr Arg Glu Ala Lys Glu Cys Ile Tyr Val Glu Pro Asp
355 360 365

Arg Glu Gly Asp Lys Lys Gly Val Tyr Trp Tyr Asn Asn Lys Leu
370 375 380

<210> 31

<211> 1056

<212> DNA

<213> Brassica napus

<400> 31

atggcttcaa taaatgaaga tgtgtctatt ggaaacttag gcagtctcca aacactccca 60

gactcattca cctggaaact caccgctgct gactccattc tccctccctc ctccgccgct 120

gtgaaagagt ccattccggt catcgacctc tccgatactg acgtcaccaa tttgtagga 180

aatgcatgca aaacgtgggg agcgtttcag atagccaacc acgggggtctc tcaaagtctc 240

ctcgacgacg ttgaatctct ctccaaaacc tttttcgata tgccgtcaga gaggaaactc 300

gaggctgctt cctctaataa aggagttagt gggtagcgag aacctcgaat ctctcttttc 360

ttcgagaaga aaatgtggtc tgaagggttg acaatcgccg acggctccta ccgcaaccag 420

ttccttacta tttggccccg tgattacacc aaatactgcg gaataatcga agagtacaag 480

ggtgaaatgg aaaaattagc aagcagactt ctatcatgca tattaggatc acttggtgtc 540
 accgtagacg acatcgaatg ggctaagaag accgagaaat ctgaatcaaa aatggggccaa 600
 agcgtcatac gactaaacca ttacccgggtt tgtcctgagc cagaaagagc catgggtcta 660
 gccgctcata ccgactcatg tcttctaacc attttgcacc agagcaacat gggagggcta 720
 caagtgttca aagaagagtc cggttggggtt acggtagagc ccattcctgg tgttcttgtg 780
 gtcaacatcg gcgacctctt tcacattcta tcgaatggga agtttcctag cgtgggtcac 840
 cgagcaaggg ttaaccgaac caagtcaaga atatcgatag cgtatctgtg ggggtgtcca 900
 gccggtgaag tggagataag tccaatatca aagatagttg gtccggttg accgtgtcta 960
 taccggccag ttacttggag tgaatatctc cgaatcaaat ttgaggtttt cgacaaggca 1020
 ttggacgcaa ttggagtcgt taatcccacc aattga 1056

<210> 32

<211> 351

<212> PRT

<213> Brassica napus

<400> 32

Met Ala Ser Ile Asn Glu Asp Val Ser Ile Gly Asn Leu Gly Ser Leu
 1 5 10 15

Gln Thr Leu Pro Asp Ser Phe Thr Trp Lys Leu Thr Ala Ala Asp Ser
 20 25 30

Ile Leu Pro Pro Ser Ser Ala Ala Val Lys Glu Ser Ile Pro Val Ile
 35 40 45

Asp Leu Ser Asp Pro Asp Val Thr Asn Leu Leu Gly Asn Ala Cys Lys
 50 55 60

Thr Trp Gly Ala Phe Gln Ile Ala Asn His Gly Val Ser Gln Ser Leu
 65 70 75 80

Leu Asp Asp Val Glu Ser Leu Ser Lys Thr Phe Phe Asp Met Pro Ser
 85 90 95

Glu Arg Lys Leu Glu Ala Ala Ser Ser Asn Lys Gly Val Ser Gly Tyr
 100 105 110

Gly Glu Pro Arg Ile Ser Leu Phe Phe Glu Lys Lys Met Trp Ser Glu
 115 120 125

Gly Leu Thr Ile Ala Asp Gly Ser Tyr Arg Asn Gln Phe Leu Thr Ile
 130 135 140

Trp Pro Arg Asp Tyr Thr Lys Tyr Cys Gly Ile Ile Glu Glu Tyr Lys
 145 150 155 160

Gly Glu Met Glu Lys Leu Ala Ser Arg Leu Leu Ser Cys Ile Leu Gly
 165 170 175

Ser Leu Gly Val Thr Val Asp Asp Ile Glu Trp Ala Lys Lys Thr Glu
 180 185 190

Lys Ser Glu Ser Lys Met Gly Gln Ser Val Ile Arg Leu Asn His Tyr
 195 200 205

Pro Val Cys Pro Glu Pro Glu Arg Ala Met Gly Leu Ala Ala His Thr
 210 215 220

Asp Ser Cys Leu Leu Thr Ile Leu His Gln Ser Asn Met Gly Gly Leu
 225 230 235 240

Gln Val Phe Lys Glu Glu Ser Gly Trp Val Thr Val Glu Pro Ile Pro
 245 250 255

Gly Val Leu Val Val Asn Ile Gly Asp Leu Phe His Ile Leu Ser Asn
 260 265 270

Gly Lys Phe Pro Ser Val Val His Arg Ala Arg Val Asn Arg Thr Lys
 275 280 285

Ser Arg Ile Ser Ile Ala Tyr Leu Trp Gly Gly Pro Ala Gly Glu Val
 290 295 300

Glu Ile Ser Pro Ile Ser Lys Ile Val Gly Pro Val Gly Pro Cys Leu
 305 310 315 320

Tyr Arg Pro Val Thr Trp Ser Glu Tyr Leu Arg Ile Lys Phe Glu Val
 325 330 335

Phe Asp Lys Ala Leu Asp Ala Ile Gly Val Val Asn Pro Thr Asn
 340 345 350

<210> 33
 <211> 639
 <212> DNA
 <213> Brassica napus

<400> 33
 atggctacat tctcttgtaa ttcttatgaa caaaatcacg ctcttttcga ccgtcacgct 60
 aatgatactg atattgatga tcttgatcat gatcatcatg atgggtgttca gcaagaggag 120
 agtggatgga caacttatct tgaagatttc tcaaataaat acagaactca tcctgaagat 180
 aacgatcatc aagataagag ttcgtgttcg attctggacg cctctccttc tctgggtctcc 240
 gacgccgcca ctgacgcatt ttctggccgg agttttccag ttaattttcc ggtgaaattg 300
 aagtttgggga aggcaagaac caaaaagatt tgtgaggatg attctttgga ggatacggct 360
 agctctccgg ttaatagccc taaggtcagt cagattgaac atattcagac gcctcctaga 420
 aaacatgagg actatgtctc ttctagtttc gttatgggaa atatgagtgg catgggggat 480
 catcaaatcc aaatccaaga aggagatgaa caaaagttga cgatgatgag gaatctcaga 540
 gaaggaaaca acagtaacag taataatatg gacttgaggg ctagaggatt atgcgtcgtc 600
 cctattttcca tgttgggtaa ttttaatggc cgcttctga 639

<210> 34
 <211> 212
 <212> PRT
 <213> Brassica napus

<400> 34
 Met Ala Thr Phe Ser Cys Asn Ser Tyr Glu Gln Asn His Ala Pro Phe
 1 5 10 15
 Asp Arg His Ala Asn Asp Thr Asp Ile Asp Asp Pro Asp His Asp His
 20 25 30
 His Asp Gly Val Gln Gln Glu Glu Ser Gly Trp Thr Thr Tyr Leu Glu
 35 40 45
 Asp Phe Ser Asn Gln Tyr Arg Thr His Pro Glu Asp Asn Asp His Gln
 50 55 60
 Asp Lys Ser Ser Cys Ser Ile Leu Asp Ala Ser Pro Ser Leu Val Ser
 65 70 75 80
 Asp Ala Ala Thr Asp Ala Phe Ser Gly Arg Ser Phe Pro Val Asn Phe
 85 90 95

Pro Val Lys Leu Lys Phe Gly Lys Ala Arg Thr Lys Lys Ile Cys Glu
 100 105 110

Asp Asp Ser Leu Glu Asp Thr Ala Ser Ser Pro Val Asn Ser Pro Lys
 115 120 125

Val Ser Gln Ile Glu His Ile Gln Thr Pro Pro Arg Lys His Glu Asp
 130 135 140

Tyr Val Ser Ser Ser Phe Val Met Gly Asn Met Ser Gly Met Gly Asp
 145 150 155 160

His Gln Ile Gln Ile Gln Glu Gly Asp Glu Gln Lys Leu Thr Met Met
 165 170 175

Arg Asn Leu Arg Glu Gly Asn Asn Ser Asn Ser Asn Asn Met Asp Leu
 180 185 190

Arg Ala Arg Gly Leu Cys Val Val Pro Ile Ser Met Leu Gly Asn Phe
 195 200 205

Asn Gly Arg Phe
 210

<210> 35
 <211> 1143
 <212> DNA
 <213> Arabidopsis thaliana

<400> 35
 atggcaacgg aatgcattgc aacggtcctt caaatattca gtgaaaacaa aaccaaagag 60
 gattcttcga tcttcgatgc aaagctcctt aatcagcact cacaccacat acctcaacag 120
 ttcgtatggc cggaccacga gaaaccttct acggatgttc aacctctcca agtcccactc 180
 atagacctag cgggtttcct ctccggcgac tcgtgcttgg catcggaggc tactagactc 240
 gtctcaaagg ctgcaacgaa acatggcttc ttcctaata ctaaccatgg tatcgatgag 300
 agcctcttgt ctctgacctt tctgcatatg gactctttct ttaaggcccc ggcttgtgag 360
 aagcagaagg ctgagaggaa gtgggggtgag agctccggtt acgctagtag tttcgtcggg 420
 agattctcct caaagctccc gtggaaggag actctgtcgt ttaagttctc tcccaggagg 480
 aagatccatt cccaaaccgt taaagacttt gtttctaaga aaatgtgcga tggatacgaa 540
 gatttcggga aggtttatca agaatacgcg gaggccatga acactctctc actaaagatc 600

atggagcttc ttggaatgag tcttggggtc gagaggagat attttaaaga gtttttcgaa 660
 gacagcgatt caatattccg gttgaattac taccgcgagt gcaagcaacc ggagcttgca 720
 ctagggacag gacccactg cgaccaaca tctctaacca tacttcatca agaccaagtt 780
 ggcggtctgc aagttttcgt ggacaacaaa tggcaatcca ttcttctaa ccttcacgct 840
 ttcgtggtga acataggcga caccttcatg gctctaacga atggaagata caagagttgt 900
 ttgcatcggg cggtggtgaa cagcgagaga gaaaggaaga cgtttgcatt cttcctatgt 960
 ccgaaagggg aaaaagtggg gaagccacca gaagaactag taaacggagt gaagtctggg 1020
 gaaagaaagt atcctgattt tacgtggtct atgtttctcg agttcacaca gaagcattat 1080
 agggcagaca tgaacactct tgacgagttc tcaatttggc ttaagaacag aagaagtttc 1140
 taa 1143

<210> 36

<211> 380

<212> PRT

<213> Arabidopsis thaliana

<400> 36

Met Ala Thr Glu Cys Ile Ala Thr Val Pro Gln Ile Phe Ser Glu Asn
 1 5 10 15

Lys Thr Lys Glu Asp Ser Ser Ile Phe Asp Ala Lys Leu Leu Asn Gln
 20 25 30

His Ser His His Ile Pro Gln Gln Phe Val Trp Pro Asp His Glu Lys
 35 40 45

Pro Ser Thr Asp Val Gln Pro Leu Gln Val Pro Leu Ile Asp Leu Ala
 50 55 60

Gly Phe Leu Ser Gly Asp Ser Cys Leu Ala Ser Glu Ala Thr Arg Leu
 65 70 75 80

Val Ser Lys Ala Ala Thr Lys His Gly Phe Phe Leu Ile Thr Asn His
 85 90 95

Gly Ile Asp Glu Ser Leu Leu Ser Arg Ala Tyr Leu His Met Asp Ser
 100 105 110

Phe Phe Lys Ala Pro Ala Cys Glu Lys Gln Lys Ala Gln Arg Lys Trp
 115 120 125

Gly Glu Ser Ser Gly Tyr Ala Ser Ser Phe Val Gly Arg Phe Ser Ser
 130 135 140

Lys Leu Pro Trp Lys Glu Thr Leu Ser Phe Lys Phe Ser Pro Glu Glu
 145 150 155 160

Lys Ile His Ser Gln Thr Val Lys Asp Phe Val Ser Lys Lys Met Cys
 165 170 175

Asp Gly Tyr Glu Asp Phe Gly Lys Val Tyr Gln Glu Tyr Ala Glu Ala
 180 185 190

Met Asn Thr Leu Ser Leu Lys Ile Met Glu Leu Leu Gly Met Ser Leu
 195 200 205

Gly Val Glu Arg Arg Tyr Phe Lys Glu Phe Phe Glu Asp Ser Asp Ser
 210 215 220

Ile Phe Arg Leu Asn Tyr Tyr Pro Gln Cys Lys Gln Pro Glu Leu Ala
 225 230 235 240

Leu Gly Thr Gly Pro His Cys Asp Pro Thr Ser Leu Thr Ile Leu His
 245 250 255

Gln Asp Gln Val Gly Gly Leu Gln Val Phe Val Asp Asn Lys Trp Gln
 260 265 270

Ser Ile Pro Pro Asn Pro His Ala Phe Val Val Asn Ile Gly Asp Thr
 275 280 285

Phe Met Ala Leu Thr Asn Gly Arg Tyr Lys Ser Cys Leu His Arg Ala
 290 295 300

Val Val Asn Ser Glu Arg Glu Arg Lys Thr Phe Ala Phe Phe Leu Cys
 305 310 315 320

Pro Lys Gly Glu Lys Val Val Lys Pro Pro Glu Glu Leu Val Asn Gly
 325 330 335

Val Lys Ser Gly Glu Arg Lys Tyr Pro Asp Phe Thr Trp Ser Met Phe
 340 345 350

Leu Glu Phe Thr Gln Lys His Tyr Arg Ala Asp Met Asn Thr Leu Asp
 355 360 365

Glu Phe Ser Ile Trp Leu Lys Asn Arg Arg Ser Phe
 370 375 380

<210> 37

<211> 1908

<212> DNA

<213> Arabidopsis thaliana

<400> 37

atggcgctcag agcaagcaag gagagaaaac aaggtgacgg agagagaagt tcaggtggag	60
aaagacagag tcccaaagat gacgagtcac ttcgagtcca tggccgaaaa aggcaaagat	120
tccgacacac acaggcatca aacagaaggt ggtgggacac agttcgtgtc tctctcagac	180
aaggggagta acatgccggt ttctgatgaa ggagagggag agacgaagat gaagaggact	240
cagatgcctc actccgttgg aaaattcggt actagcagcg attcaggaac agggaagaag	300
aaggatgaga aagaggagca tgagaaggcg tcgctagagg atattcatgg gtatagagcc	360
aatgctcagc agaagtcaat ggatagtata aaagcagcag aggaaaggta taacaaggct	420
aaggagagtt tgagccatag tggacaagaa gtcctgaggag gaagaggtga agaaatggtg	480
ggaaaagggc gggacagtgg tgtccgtgtt tctcacgttg gggctgttgg tggcgggtgt	540
ggaggtgagg aaaaagagag tgggtgtacat ggctttcatg gggagaaagc acgacatgct	600
gagcttttgg ctgccggagg tgaggagatg agagaacgtg aaggtaaaga atcagcaggt	660
ggtgttggtg gtcgtagcgt aaaagatacg gtagccgaga aaggacagca agctaaggaa	720
agtgtaggag aaggtgctca gaaagcgggc agtgctacga gtgagaaagc tcagagagct	780
tccgagtatg caacagagaa aggaaaagaa gctggaaata tgacagctga acaggcggcg	840
agagcaaaag actatgctct gcagaaagct gttgaagcta aagagactgc ggcggagaaa	900
gctcagagag cttccgagta tatgaaggaa acaggaagca cagcggctga acaggctgcg	960
agagctaaag attacactct tcagaaagct gtggaagcta aagatgttgc agctgagaaa	1020
gctcagagag cttcagaata catgacagag acaggaaaac aagccggaaa tgttgcagct	1080
cagaaagggc aagaggcagc ttcaatgaca gcaaaagcta aagattatac tgttcagaaa	1140
gccggtgaag cagctgggta cataaaagaa acgacagtgg aaggaggaaa aggagctgca	1200
cattatgcag gagtggcagc tgagaaagcc gctgcggttg ggtggacagc ggcacatttc	1260
accacggaga aagtgggtgca agggacgaaa gcggttgcag gtacagtgga aggtgctgtg	1320

42/121

gggtacgcag ggcataaggc ggtggaagta ggatctaagg cagtggactt gactaaggag 1380
 aaagctgcag tggctgctga tacggtggtt ggggtatacgg cgaggaagaa agaggaagct 1440
 caacacagag accaagagat gcatcagggg ggtgaggaag aaaagcaacc aggggtttgtc 1500
 tcaggagcaa ggagagactt tggagaagag tacggggaag aaagagggag tgagaaagat 1560
 gtctacggct atggagcaaa aggaataccc ggagaaggga ggggagatgt tggggaggca 1620
 gagtacggaa gagggagtga gaaagatgtc ttcggatatg gaccaaagg cacggtcgaa 1680
 gaagcaagga gagacgttg agaagaatac ggaggaggaa gaggcagtga gagatatgtt 1740
 gaagaagaag gggttggagc gggaggggtg cttggggcaa tcggcgagac tatagctgag 1800
 attgcacaga cgacaaagaa catagtatt ggtgatgcgc ctgtgaggac acatgagcat 1860
 ggaactactg atcctgacta tatgagacgg gaacatggac aacgttga 1908

<210> 38

<211> 635

<212> PRT

<213> Arabidopsis thaliana

<400> 38

Met Ala Ser Glu Gln Ala Arg Arg Glu Asn Lys Val Thr Glu Arg Glu
 1 5 10 15

Val Gln Val Glu Lys Asp Arg Val Pro Lys Met Thr Ser His Phe Glu
 20 25 30

Ser Met Ala Glu Lys Gly Lys Asp Ser Asp Thr His Arg His Gln Thr
 35 40 45

Glu Gly Gly Gly Thr Gln Phe Val Ser Leu Ser Asp Lys Gly Ser Asn
 50 55 60

Met Pro Val Ser Asp Glu Gly Glu Gly Glu Thr Lys Met Lys Arg Thr
 65 70 75 80

Gln Met Pro His Ser Val Gly Lys Phe Val Thr Ser Ser Asp Ser Gly
 85 90 95

Thr Gly Lys Lys Lys Asp Glu Lys Glu Glu His Glu Lys Ala Ser Leu
 100 105 110

Glu Asp Ile His Gly Tyr Arg Ala Asn Ala Gln Gln Lys Ser Met Asp
 115 120 125

Ser Ile Lys Ala Ala Glu Glu Arg Tyr Asn Lys Ala Lys Glu Ser Leu
 130 135 140

Ser His Ser Gly Gln Glu Ala Arg Gly Gly Arg Gly Glu Glu Met Val
 145 150 155 160

Gly Lys Gly Arg Asp Ser Gly Val Arg Val Ser His Val Gly Ala Val
 165 170 175

Gly Gly Gly Gly Gly Gly Glu Glu Lys Glu Ser Gly Val His Gly Phe
 180 185 190

His Gly Glu Lys Ala Arg His Ala Glu Leu Leu Ala Ala Gly Gly Glu
 195 200 205

Glu Met Arg Glu Arg Glu Gly Lys Glu Ser Ala Gly Gly Val Gly Gly
 210 215 220

Arg Ser Val Lys Asp Thr Val Ala Glu Lys Gly Gln Gln Ala Lys Glu
 225 230 235 240

Ser Val Gly Glu Gly Ala Gln Lys Ala Gly Ser Ala Thr Ser Glu Lys
 245 250 255

Ala Gln Arg Ala Ser Glu Tyr Ala Thr Glu Lys Gly Lys Glu Ala Gly
 260 265 270

Asn Met Thr Ala Glu Gln Ala Ala Arg Ala Lys Asp Tyr Ala Leu Gln
 275 280 285

Lys Ala Val Glu Ala Lys Glu Thr Ala Ala Glu Lys Ala Gln Arg Ala
 290 295 300

Ser Glu Tyr Met Lys Glu Thr Gly Ser Thr Ala Ala Glu Gln Ala Ala
 305 310 315 320

Arg Ala Lys Asp Tyr Thr Leu Gln Lys Ala Val Glu Ala Lys Asp Val
 325 330 335

Ala Ala Glu Lys Ala Gln Arg Ala Ser Glu Tyr Met Thr Glu Thr Gly
 340 345 350

Lys Gln Ala Gly Asn Val Ala Ala Gln Lys Gly Gln Glu Ala Ala Ser
 355 360 365

Met Thr Ala Lys Ala Lys Asp Tyr Thr Val Gln Lys Ala Gly Glu Ala
 370 375 380

Ala Gly Tyr Ile Lys Glu Thr Thr Val Glu Gly Gly Lys Gly Ala Ala
 385 390 395 400

His Tyr Ala Gly Val Ala Ala Glu Lys Ala Ala Ala Val Gly Trp Thr
 405 410 415

Ala Ala His Phe Thr Thr Glu Lys Val Val Gln Gly Thr Lys Ala Val
 420 425 430

Ala Gly Thr Val Glu Gly Ala Val Gly Tyr Ala Gly His Lys Ala Val
 435 440 445

Glu Val Gly Ser Lys Ala Val Asp Leu Thr Lys Glu Lys Ala Ala Val
 450 455 460

Ala Ala Asp Thr Val Val Gly Tyr Thr Ala Arg Lys Lys Glu Glu Ala
 465 470 475 480

Gln His Arg Asp Gln Glu Met His Gln Gly Gly Glu Glu Glu Lys Gln
 485 490 495

Pro Gly Phe Val Ser Gly Ala Arg Arg Asp Phe Gly Glu Glu Tyr Gly
 500 505 510

Glu Glu Arg Gly Ser Glu Lys Asp Val Tyr Gly Tyr Gly Ala Lys Gly
 515 520 525

Ile Pro Gly Glu Gly Arg Gly Asp Val Gly Glu Ala Glu Tyr Gly Arg
 530 535 540

Gly Ser Glu Lys Asp Val Phe Gly Tyr Gly Pro Lys Gly Thr Val Glu
 545 550 555 560

Glu Ala Arg Arg Asp Val Gly Glu Glu Tyr Gly Gly Gly Arg Gly Ser
 565 570 575

Glu Arg Tyr Val Glu Glu Glu Gly Val Gly Ala Gly Gly Val Leu Gly
 580 585 590

Ala Ile Gly Glu Thr Ile Ala Glu Ile Ala Gln Thr Thr Lys Asn Ile
 595 600 605

Val Ile Gly Asp Ala Pro Val Arg Thr His Glu His Gly Thr Thr Asp
 610 615 620

Pro Asp Tyr Met Arg Arg Glu His Gly Gln Arg
 625 630 635

<210> 39

<211> 1461

<212> DNA

<213> Arabidopsis thaliana

<400> 39

atggctaagt cttgctatatt cagaccagct cttcttcttc tgttagttct tttggttcat	60
gccgagtcac gcggtcgggt cgagccaaag attcttatgc cgacagagga agctaaccgc	120
gctgaccaag acggagatgg tgcgggtaca agatgggcgg ttctcgtcgc tggttcttct	180
ggatatggaa actacagaca ccaggctgac atgtgtcacg catatcaaat actaagaaaa	240
ggagggtttaa aggaagagaa catagtcggt ttgatgtatg atgatatcgc aaaccacca	300
cttaatcctc gtccgggtac tctcatcaac catcctgacg gtgacgatgt ttacgccgga	360
gtccctaagg actatactgg tagtagtggt acggctgcaa acttctacgc tgtactccta	420
ggcgaccaga aggctgttaa aggtggaagc ggtaaggcca tcgctagcaa gcccacgat	480
cacattttcg tatattatgc ggatcatggt ggtcccgag ttcttgggat gccaaatagc	540
cctcacatat atgcagctga ttttattgaa acgcttaaga agaagcatgc ttccggaaca	600
tacaaagaga tggttatata cgtagaagcg tgtgaaagtg ggagtatttt cgaagggata	660
atgccaaagg acttgaacat ttacgtaaca acggcttcaa atgcacaaga gagtagttat	720
ggaacatatt gtcctggcat gaatccgtca ccccatctg aatatatcac ttgcttaggg	780
gatttatata gtgttgcttg gatggaagat agtgagactc acaatttaaa gaaagagacc	840
ataaagcaac aataccacac ggtgaagatg aggacatcaa actacaatac ctactcaggt	900
ggctctcatg tgatggaata cggtacaat agtattaagt cggagaagct ttatctttac	960
caagggtttg atccagccac cgtaaatctc ccactaaacg aattaccggt caagtcaaaa	1020
ataggagtcg ttaaccaacg cgatgcggac cttctcttcc tttggcatat gtatcggaca	1080
tcggaagatg ggtcaaggaa gaaggatgac acattgaagg aattaactga gacaacaagg	1140

46/121

cataggaaac atttagatgc aagcgctcgaa ttgatagcca caattttggt tgggtccgacg 1200
 atgaatgttc ttaacttggg tagagaaccc ggtttgcctt tgggtgacga ttgggaatgt 1260
 cttaaatacga tgggtacgtgt atttgaagag cattgtggat cactaacgca atatgggatg 1320
 aaacatatgc gagcggttgc aaacggttgc aacaacggtg tgtccaaaga gctgatggag 1380
 gaagcttcta ctgcggcatg cggtgggttat agtgaggctc gctacacggt gcatccatca 1440
 atcttaggct atagcgctg a 1461

<210> 40

<211> 486

<212> PRT

<213> Arabidopsis thaliana

<400> 40

Met Ala Lys Ser Cys Tyr Phe Arg Pro Ala Leu Leu Leu Leu Leu Val
 1 5 10 15

Leu Leu Val His Ala Glu Ser Arg Gly Arg Phe Glu Pro Lys Ile Leu
 20 25 30

Met Pro Thr Glu Glu Ala Asn Pro Ala Asp Gln Asp Gly Asp Gly Val
 35 40 45

Gly Thr Arg Trp Ala Val Leu Val Ala Gly Ser Ser Gly Tyr Gly Asn
 50 55 60

Tyr Arg His Gln Ala Asp Met Cys His Ala Tyr Gln Ile Leu Arg Lys
 65 70 75 80

Gly Gly Leu Lys Glu Glu Asn Ile Val Val Leu Met Tyr Asp Asp Ile
 85 90 95

Ala Asn His Pro Leu Asn Pro Arg Pro Gly Thr Leu Ile Asn His Pro
 100 105 110

Asp Gly Asp Asp Val Tyr Ala Gly Val Pro Lys Asp Tyr Thr Gly Ser
 115 120 125

Ser Val Thr Ala Ala Asn Phe Tyr Ala Val Leu Leu Gly Asp Gln Lys
 130 135 140

Ala Val Lys Gly Gly Ser Gly Lys Val Ile Ala Ser Lys Pro Asn Asp
 145 150 155 160

His Ile Phe Val Tyr Tyr Ala Asp His Gly Gly Pro Gly Val Leu Gly
165 170 175

Met Pro Asn Thr Pro His Ile Tyr Ala Ala Asp Phe Ile Glu Thr Leu
180 185 190

Lys Lys Lys His Ala Ser Gly Thr Tyr Lys Glu Met Val Ile Tyr Val
195 200 205

Glu Ala Cys Glu Ser Gly Ser Ile Phe Glu Gly Ile Met Pro Lys Asp
210 215 220

Leu Asn Ile Tyr Val Thr Thr Ala Ser Asn Ala Gln Glu Ser Ser Tyr
225 230 235 240

Gly Thr Tyr Cys Pro Gly Met Asn Pro Ser Pro Pro Ser Glu Tyr Ile
245 250 255

Thr Cys Leu Gly Asp Leu Tyr Ser Val Ala Trp Met Glu Asp Ser Glu
260 265 270

Thr His Asn Leu Lys Lys Glu Thr Ile Lys Gln Gln Tyr His Thr Val
275 280 285

Lys Met Arg Thr Ser Asn Tyr Asn Thr Tyr Ser Gly Gly Ser His Val
290 295 300

Met Glu Tyr Gly Asn Asn Ser Ile Lys Ser Glu Lys Leu Tyr Leu Tyr
305 310 315 320

Gln Gly Phe Asp Pro Ala Thr Val Asn Leu Pro Leu Asn Glu Leu Pro
325 330 335

Val Lys Ser Lys Ile Gly Val Val Asn Gln Arg Asp Ala Asp Leu Leu
340 345 350

Phe Leu Trp His Met Tyr Arg Thr Ser Glu Asp Gly Ser Arg Lys Lys
355 360 365

Asp Asp Thr Leu Lys Glu Leu Thr Glu Thr Thr Arg His Arg Lys His
370 375 380

Leu Asp Ala Ser Val Glu Leu Ile Ala Thr Ile Leu Phe Gly Pro Thr
385 390 395 400

Met Asn Val Leu Asn Leu Val Arg Glu Pro Gly Leu Pro Leu Val Asp
405 410 415

Asp Trp Glu Cys Leu Lys Ser Met Val Arg Val Phe Glu Glu His Cys
420 425 430

Gly Ser Leu Thr Gln Tyr Gly Met Lys His Met Arg Ala Phe Ala Asn
435 440 445

Val Cys Asn Asn Gly Val Ser Lys Glu Leu Met Glu Glu Ala Ser Thr
450 455 460

Ala Ala Cys Gly Gly Tyr Ser Glu Ala Arg Tyr Thr Val His Pro Ser
465 470 475 480

Ile Leu Gly Tyr Ser Ala
485

<210> 41

<211> 1551

<212> DNA

<213> Arabidopsis thaliana

<400> 41

atggacggtg ccggagaatc acgactcggg ggtgatggtg gtggtgatgg ttctgttgga	60
gttcagatcc gacaaacacg gatgctaccg gattttctcc agagcgtgaa tctcaagtat	120
gtgaaattag gttaccatta cttaatatca aatctcttga ctctctgttt attccctctc	180
gccgttggtta tctccgtcga agcctctcag atgaaccag atgatctcaa acagctctgg	240
atccatctac aatacaatct ggtagtatc atcatctggt cagcgattct agtcttcggg	300
ttaacggttt atgttatgac ccgacctaga cccgtttact tgggtgattt ctcttggtat	360
ctccacctg atcatctcaa agctccttac gctcggttca tggaacattc tagactcacc	420
ggagatttcg atgactctgc tctcgagttt caacgcaaga tccttgagcg ttctgggtta	480
ggggaagaca cttatgtccc tgaagctatg cattatgttc caccgagaat ttcaatggct	540
gctgctagag aagaagctga acaagtcatg tttggtgctt tagataacct ttctgctaac	600
actaatgtga aaccaaagga tattggaatc cttgttgtga attgtagtct ctttaatcca	660
actccttcgt tatctgcaat gattgtgaac aagtataagc ttagaggtaa cattagaagc	720

tacaatctag gcggtatggg ttgcagcgcg ggagttatcg ctgtggatct tgctaaagac 780
 atgttggttg tacataggaa cacttatgcy gttgttgttt ctactgagaa cattactcag 840
 aattggtatt ttggttaacaa gaaatcgatg ttgataccga actgcttggt tcgagttggt 900
 ggctctgcgg ttttgctatc gaacaagtcg agggacaaga gacgggtctaa gtacaggctt 960
 gtacatgtag tcaggactca ccgtggagca gatgataaag ctttccgttg tgtttatcaa 1020
 gagcaggatg atacaggag aaccgggggt tcgttgtcga aagatctaag ggcgattgca 1080
 ggggaaactc tcaaaaccaa tatcactaca ttgggtcctc ttgttctacc gataagtga 1140
 cagattctct tctttatgac tctagtgtg aagaagctct ttaacggtaa agtgaaaccg 1200
 tatatcccgg atttcaaact tgctttcgag catttctgta tccatgctgg tggaagagct 1260
 gtgatcgatg agttagagaa gaatctgcag ctttcaccag ttcatgtcga ggcttcgagg 1320
 atgactcttc atcgatttgg taacacatct tcgagctcca tttggatga attggcttac 1380
 attgaagcga aggaaggat gcgaagaggt aatcgtgtt ggcaaactgc gttcggaagt 1440
 ggatttaaag gtaatagcgc gatttgggaa gcattaaggc atgtgaaacc ttcgaacaac 1500
 agtccttggg aagattgtat tgacaagtat ccggtaactt taagttatta g 1551

<210> 42

<211> 516

<212> PRT

<213> *Arabidopsis thaliana*

<400> 42

Met Asp Gly Ala Gly Glu Ser Arg Leu Gly Gly Asp Gly Gly Gly Asp
 1 5 10 15

Gly Ser Val Gly Val Gln Ile Arg Gln Thr Arg Met Leu Pro Asp Phe
 20 25 30

Leu Gln Ser Val Asn Leu Lys Tyr Val Lys Leu Gly Tyr His Tyr Leu
 35 40 45

Ile Ser Asn Leu Leu Thr Leu Cys Leu Phe Pro Leu Ala Val Val Ile
 50 55 60

Ser Val Glu Ala Ser Gln Met Asn Pro Asp Asp Leu Lys Gln Leu Trp
 65 70 75 80

Ile His Leu Gln Tyr Asn Leu Val Ser Ile Ile Ile Cys Ser Ala Ile
 85 90 95

Leu Val Phe Gly Leu Thr Val Tyr Val Met Thr Arg Pro Arg Pro Val
 100 105 110

Tyr Leu Val Asp Phe Ser Cys Tyr Leu Pro Pro Asp His Leu Lys Ala
 115 120 125

Pro Tyr Ala Arg Phe Met Glu His Ser Arg Leu Thr Gly Asp Phe Asp
 130 135 140

Asp Ser Ala Leu Glu Phe Gln Arg Lys Ile Leu Glu Arg Ser Gly Leu
 145 150 155 160

Gly Glu Asp Thr Tyr Val Pro Glu Ala Met His Tyr Val Pro Pro Arg
 165 170 175

Ile Ser Met Ala Ala Ala Arg Glu Glu Ala Glu Gln Val Met Phe Gly
 180 185 190

Ala Leu Asp Asn Leu Phe Ala Asn Thr Asn Val Lys Pro Lys Asp Ile
 195 200 205

Gly Ile Leu Val Val Asn Cys Ser Leu Phe Asn Pro Thr Pro Ser Leu
 210 215 220

Ser Ala Met Ile Val Asn Lys Tyr Lys Leu Arg Gly Asn Ile Arg Ser
 225 230 235 240

Tyr Asn Leu Gly Gly Met Gly Cys Ser Ala Gly Val Ile Ala Val Asp
 245 250 255

Leu Ala Lys Asp Met Leu Leu Val His Arg Asn Thr Tyr Ala Val Val
 260 265 270

Val Ser Thr Glu Asn Ile Thr Gln Asn Trp Tyr Phe Gly Asn Lys Lys
 275 280 285

Ser Met Leu Ile Pro Asn Cys Leu Phe Arg Val Gly Gly Ser Ala Val
 290 295 300

Leu Leu Ser Asn Lys Ser Arg Asp Lys Arg Arg Ser Lys Tyr Arg Leu
 305 310 315 320

51/121

Val His Val Val Arg Thr His Arg Gly Ala Asp Asp Lys Ala Phe Arg
325 330 335

Cys Val Tyr Gln Glu Gln Asp Asp Thr Gly Arg Thr Gly Val Ser Leu
340 345 350

Ser Lys Asp Leu Met Ala Ile Ala Gly Glu Thr Leu Lys Thr Asn Ile
355 360 365

Thr Thr Leu Gly Pro Leu Val Leu Pro Ile Ser Glu Gln Ile Leu Phe
370 375 380

Phe Met Thr Leu Val Val Lys Lys Leu Phe Asn Gly Lys Val Lys Pro
385 390 395 400

Tyr Ile Pro Asp Phe Lys Leu Ala Phe Glu His Phe Cys Ile His Ala
405 410 415

Gly Gly Arg Ala Val Ile Asp Glu Leu Glu Lys Asn Leu Gln Leu Ser
420 425 430

Pro Val His Val Glu Ala Ser Arg Met Thr Leu His Arg Phe Gly Asn
435 440 445

Thr Ser Ser Ser Ser Ile Trp Tyr Glu Leu Ala Tyr Ile Glu Ala Lys
450 455 460

Gly Arg Met Arg Arg Gly Asn Arg Val Trp Gln Ile Ala Phe Gly Ser
465 470 475 480

Gly Phe Lys Cys Asn Ser Ala Ile Trp Glu Ala Leu Arg His Val Lys
485 490 495

Pro Ser Asn Asn Ser Pro Trp Glu Asp Cys Ile Asp Lys Tyr Pro Val
500 505 510

Thr Leu Ser Tyr
515

<210> 43

<211> 639

<212> DNA

<213> Arabidopsis thaliana

<400> 43
 atgtcgagag ctttgtcagt cgtttgtgtc ttgctcgcca tatecttcgt ctgtgcacgt 60
 gctcgtcagg tgccgggaga gtctgatgag ggaaagacga cgggacatga cgatacaaca 120
 acaatgccca tgcattgcaaa agcagctgat cagttaccac caaagagcgt cggcgacaaa 180
 aaatgcatcg gaggagttgc tggagtcggt ggattcgccg gagttggtgg tgttgccggc 240
 gtgggaggtc tagggatgcc actcatcggt ggtcttggcg ggatcggtaa gtatggtggc 300
 ataggcgggtg cagctggaat cgggtggattt catagtatag gcggtggtgg cggctctaggc 360
 ggtgtcggag gaggtggtgg cggctctaggc ggtgttggag ggggtggtgg tggctctaggc 420
 ggcgttggcg gtctagggtgg agctgggtta ggcggtgtag gtggtggtgg cgggtggtatt 480
 ggtaaagccg gtggtattgg cgggtttaggt ggtctaggcg gagccggagg tgggtttaggt 540
 ggagttggtg gtctcggtaa ggctggtggt attggtggtg gtggtggtat cgggtggtgga 600
 cacggcgtgg tcggtggtgt gatcgatcca catecttaa 639

<210> 44
 <211> 212
 <212> PRT
 <213> Arabidopsis thaliana

<400> 44
 Met Ser Arg Ala Leu Ser Val Val Cys Val Leu Leu Ala Ile Ser Phe
 1 5 10 15
 Val Cys Ala Arg Ala Arg Gln Val Pro Gly Glu Ser Asp Glu Gly Lys
 20 25 30
 Thr Thr Gly His Asp Asp Thr Thr Thr Met Pro Met His Ala Lys Ala
 35 40 45
 Ala Asp Gln Leu Pro Pro Lys Ser Val Gly Asp Lys Lys Cys Ile Gly
 50 55 60
 Gly Val Ala Gly Val Gly Gly Phe Ala Gly Val Gly Gly Val Ala Gly
 65 70 75 80
 Val Gly Gly Leu Gly Met Pro Leu Ile Gly Gly Leu Gly Gly Ile Gly
 85 90 95
 Lys Tyr Gly Gly Ile Gly Gly Ala Ala Gly Ile Gly Gly Phe His Ser
 100 105 110

Ile Gly Gly Val Gly Gly Leu Gly Gly Val Gly Gly Gly Val Gly Gly
 115 120 125

Leu Gly Gly Val Gly Gly Gly Val Gly Gly Leu Gly Gly Val Gly Gly
 130 135 140

Leu Gly Gly Ala Gly Leu Gly Gly Val Gly Gly Val Gly Gly Gly Ile
 145 150 155 160

Gly Lys Ala Gly Gly Ile Gly Gly Leu Gly Gly Leu Gly Gly Ala Gly
 165 170 175

Gly Gly Leu Gly Gly Val Gly Gly Leu Gly Lys Ala Gly Gly Ile Gly
 180 185 190

Val Gly Gly Gly Ile Gly Gly Gly His Gly Val Val Gly Gly Val Ile
 195 200 205

Asp Pro His Pro
 210

<210> 45
 <211> 684
 <212> DNA
 <213> Arabidopsis thaliana

<400> 45
 atggcaagca gcgacgtgaa gctgatcggt gcatgggcga gtccctttgt gatgaggccg 60
 aggattgctc taaacctcaa gtctgtcccc tacgagttcc tccaagagac gtttggtctc 120
 aagagcgagt tgcttcttaa atcaaaccg gttcacaaga agatccccggt tctgcttcat 180
 gctgataaac cggtgagtga gtccaacatc atcgttgagt atatcgatga cacttggagc 240
 tcatctggac cgtccattct cccttcgat ccttacgatc gggccatggc tcggttctgg 300
 gctgcttaca tcgacgaaaa gtggtttgtc gctctaagag gtttcctaaa agccggagga 360
 gaagaagaga agaaagctgt gatagctcaa ctagaagaag ggaatgcgtt tctggagaag 420
 gcgttcattg attgcagcaa aggaaaaccg ttcttcaacg gtgacaacat cggttacctc 480
 gacattgctc tcgggtgctt cttggcttgg ttgagagtca ccgagttagc agtcagctat 540
 aaaattcttg atgaggccaa gacaccttct ttgtccaaat gggctgagaa tttctgtaat 600
 gatcccgtg taaaacctgt catgcccgag actgcaaagc ttgctgaatt cgcaaagaag 660
 atctttccta agccgcaggc ctaa 684

<210> 46
 <211> 227
 <212> PRT
 <213> Arabidopsis thaliana

<400> 46

Met Ala Ser Ser Asp Val Lys Leu Ile Gly Ala Trp Ala Ser Pro Phe
 1 5 10 15

Val Met Arg Pro Arg Ile Ala Leu Asn Leu Lys Ser Val Pro Tyr Glu
 20 25 30

Phe Leu Gln Glu Thr Phe Gly Ser Lys Ser Glu Leu Leu Lys Ser
 35 40 45

Asn Pro Val His Lys Lys Ile Pro Val Leu Leu His Ala Asp Lys Pro
 50 55 60

Val Ser Glu Ser Asn Ile Ile Val Glu Tyr Ile Asp Asp Thr Trp Ser
 65 70 75 80

Ser Ser Gly Pro Ser Ile Leu Pro Ser Asp Pro Tyr Asp Arg Ala Met
 85 90 95

Ala Arg Phe Trp Ala Ala Tyr Ile Asp Glu Lys Trp Phe Val Ala Leu
 100 105 110

Arg Gly Phe Leu Lys Ala Gly Gly Glu Glu Glu Lys Lys Ala Val Ile
 115 120 125

Ala Gln Leu Glu Glu Gly Asn Ala Phe Leu Glu Lys Ala Phe Ile Asp
 130 135 140

Cys Ser Lys Gly Lys Pro Phe Phe Asn Gly Asp Asn Ile Gly Tyr Leu
 145 150 155 160

Asp Ile Ala Leu Gly Cys Phe Leu Ala Trp Leu Arg Val Thr Glu Leu
 165 170 175

Ala Val Ser Tyr Lys Ile Leu Asp Glu Ala Lys Thr Pro Ser Leu Ser
 180 185 190

Lys Trp Ala Glu Asn Phe Cys Asn Asp Pro Ala Val Lys Pro Val Met
 195 200 205

Pro Glu Thr Ala Lys Leu Ala Glu Phe Ala Lys Lys Ile Phe Pro Lys
 210 215 220

Pro Gln Ala
 225

<210> 47
 <211> 279
 <212> DNA
 <213> Arabidopsis thaliana

<400> 47
 atggcgtctc aacaagagaa gaagcagctg gatgagaggg caaagaaggg cgagaccgtc 60
 gtgccagggtg gtacggggagg caaaagcttc gaagctcaac agcatctcgc tgaagggagg 120
 agccgaggag ggcaaactcg aaaggagcag ttaggaactg aaggatatca gcagatggga 180
 cgcaaagggtg gtcttagcac cggagacaag cctgggtgggg aacacgctga ggaggaagga 240
 gtcgagatag acgaatccaa attcaggacc aagacctaa 279

<210> 48
 <211> 92
 <212> PRT
 <213> Arabidopsis thaliana

<400> 48
 Met Ala Ser Gln Gln Glu Lys Lys Gln Leu Asp Glu Arg Ala Lys Lys
 1 5 10 15

Gly Glu Thr Val Val Pro Gly Gly Thr Gly Gly Lys Ser Phe Glu Ala
 20 25 30

Gln Gln His Leu Ala Glu Gly Arg Ser Arg Gly Gly Gln Thr Arg Lys
 35 40 45

Glu Gln Leu Gly Thr Glu Gly Tyr Gln Gln Met Gly Arg Lys Gly Gly
 50 55 60

Leu Ser Thr Gly Asp Lys Pro Gly Gly Glu His Ala Glu Glu Glu Gly
 65 70 75 80

Val Glu Ile Asp Glu Ser Lys Phe Arg Thr Lys Thr
 85 90

<210> 49
 <211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 49

atggcgcgcc cgacatgaag cgacgttgaa cg

32

<210> 50

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 50

gcttaattaa ctttcgcgag ccttcaggcc gc

32

<210> 51

<211> 1131

<212> DNA

<213> Arabidopsis thaliana

<400> 51

atggctcctt caacaaaagt tctctcttta cttctcttat atggcgctgt gtcattagcc	60
tccggtgatg agtccatcat caacgaccat ctccaacttc catcggacgg caagtggaga	120
accgatgaag aagtgaggtc catctactta caatgggtccg cagaacacgg gaaaactaac	180
aacaacaaca acggtatcat caacgaccaa gacaaaagat tcaatatttt caaagacaac	240
ttaagattca tcgatctaca caacgaaaac aacaagaacg ctacttacia gcttgggtctc	300
accaaattta cccatctcac taacgatgag taccgcaagt tgtacctcgg ggcaagaact	360
gagcccgccc gccgcacgc taaggccaag aatgtcaacc agaaatactc agccgctgta	420
aacggcaagg aggttccaga gacggttgat tggagacaga aaggagccgt taaccccatc	480
aaagaccaag gaacttgccg aagttgttgg gcgttttcga ctactgcagc agtagaaggt	540
ataaacaaga tcgtaacagg agaactcata tctctatcag aacaagaact tggtgactgc	600
gacaaatcct acaatcaagg ttgcaacggc ggtttaatgg actacgcttt tcaattcatc	660
atgaaaaatg gtggcttaaa cactgagaaa gattatcctt accgtggatt cggcggaaaa	720
tgcaattctt tcttgaagaa ttctagagtt gtgagtattg atgggtacga agatgttcct	780
actaaagacg agactgcgtt gaagaaagct atttcatacc aaccggttag tgtagctatt	840
gaagccggtg gaagaatttt tcaacattac caatcgggta tttttaccgg aagttgtggt	900

57/121

acaaatcttg atcacgcggt agttgctgtc gggtagcgat cagagaacgg tgttgactac 960
tggattgtaa ggaactcttg ggggccacgt tggggtagag aaggttacat tagaatggag 1020
agaaacttgg cagcctccaa atccggtaag tgtgggattg cggttgaagc ctcgtaccgg 1080
gttaagtaca gcccaaaccg ggttcgtgga aatactatca gcagtgtttg a 1131

<210> 52
<211> 376
<212> PRT
<213> Arabidopsis thaliana

<400> 52

Met Ala Pro Ser Thr Lys Val Leu Ser Leu Leu Leu Tyr Gly Val
1 5 10 15

Val Ser Leu Ala Ser Gly Asp Glu Ser Ile Ile Asn Asp His Leu Gln
20 25 30

Leu Pro Ser Asp Gly Lys Trp Arg Thr Asp Glu Glu Val Arg Ser Ile
35 40 45

Tyr Leu Gln Trp Ser Ala Glu His Gly Lys Thr Asn Asn Asn Asn Asn
50 55 60

Gly Ile Ile Asn Asp Gln Asp Lys Arg Phe Asn Ile Phe Lys Asp Asn
65 70 75 80

Leu Arg Phe Ile Asp Leu His Asn Glu Asn Asn Lys Asn Ala Thr Tyr
85 90 95

Lys Leu Gly Leu Thr Lys Phe Thr Asp Leu Thr Asn Asp Glu Tyr Arg
100 105 110

Lys Leu Tyr Leu Gly Ala Arg Thr Glu Pro Ala Arg Arg Ile Ala Lys
115 120 125

Ala Lys Asn Val Asn Gln Lys Tyr Ser Ala Ala Val Asn Gly Lys Glu
130 135 140

Val Pro Glu Thr Val Asp Trp Arg Gln Lys Gly Ala Val Asn Pro Ile
145 150 155 160

Lys Asp Gln Gly Thr Cys Gly Ser Cys Trp Ala Phe Ser Thr Thr Ala
165 170 175

Ala Val Glu Gly Ile Asn Lys Ile Val Thr Gly Glu Leu Ile Ser Leu
 180 185 190

Ser Glu Gln Glu Leu Val Asp Cys Asp Lys Ser Tyr Asn Gln Gly Cys
 195 200 205

Asn Gly Gly Leu Met Asp Tyr Ala Phe Gln Phe Ile Met Lys Asn Gly
 210 215 220

Gly Leu Asn Thr Glu Lys Asp Tyr Pro Tyr Arg Gly Phe Gly Gly Lys
 225 230 235 240

Cys Asn Ser Phe Leu Lys Asn Ser Arg Val Val Ser Ile Asp Gly Tyr
 245 250 255

Glu Asp Val Pro Thr Lys Asp Glu Thr Ala Leu Lys Lys Ala Ile Ser
 260 265 270

Tyr Gln Pro Val Ser Val Ala Ile Glu Ala Gly Gly Arg Ile Phe Gln
 275 280 285

His Tyr Gln Ser Gly Ile Phe Thr Gly Ser Cys Gly Thr Asn Leu Asp
 290 295 300

His Ala Val Val Ala Val Gly Tyr Gly Ser Glu Asn Gly Val Asp Tyr
 305 310 315 320

Trp Ile Val Arg Asn Ser Trp Gly Pro Arg Trp Gly Glu Glu Gly Tyr
 325 330 335

Ile Arg Met Glu Arg Asn Leu Ala Ala Ser Lys Ser Gly Lys Cys Gly
 340 345 350

Ile Ala Val Glu Ala Ser Tyr Pro Val Lys Tyr Ser Pro Asn Pro Val
 355 360 365

Arg Gly Asn Thr Ile Ser Ser Val
 370 375

<210> 53

<211> 1653

<212> DNA

<213> Arabidopsis thaliana

<400> 53
atgcggtgct ttccacctcc cttatgggtgc acctccttgg tcgttttctt gtcggttacc 60
ggagccctag ccgccgatcc ctacgtcttc ttcgattgga ctgtctctta cctctctgct 120
tctcctctcg gcaactcgta acaggttaatt gggataaatg ggcaatttcc tgggtccgatt 180
ctaaacgtaa ctacgaattg gaatgttggt atgaatgtga agaataatct tgatgagcca 240
ttgcttctta catggaatgg aatccaacat agggaaaaact catggcaaga tgggtgtttg 300
ggaactaatt gtccaattcc ttctgggttg aattggactt atgagtttca agttaagat 360
cagattggta gtttctttta ttttccttct acaaatttcc aaagagcttc tgggtggttat 420
ggagggatta ttgtcaataa tcgcgctatc attccggttc ctttcgctct tcctgatggg 480
gatgttactc tctttatcag tgattgggtat actaagagcc ataagaagct gaggaaggat 540
gttgagagta agaacggcct tcgacctccg gatgggtattg tcatcaatgg atttggacct 600
tttgcttcta atggtagtcc ttttgggacc ataaacgttg aaccaggacg aacatatcgt 660
tttcgtgttc acaatagtgg cattgcgacc agcttgaatt tcagaataca gaatcataac 720
ctgcttcttg ttgagacaga agggtcatac acaattcagc agaattatac gaatatggat 780
atacatgtgg gtcaatcttt ctcatttctg gtcactatgg atcagtcctgg tagtaatgac 840
tactacattg ttgccagccc aaggtttgct acatccatca aagctagtgg agtcgctgtc 900
ttgcgctact ctaattccca aggaccgcct tcagggtccac tccctgatcc tcctattgag 960
ttggacacat ttttctcaat gaaccaagca cgatccttaa ggttgaattt gtcactctgga 1020
gctgcccgtc caaaccgcga gggatcttcc aaatatggcc agattacagt aactgatgtg 1080
tatgtgattg tcaaccgacc accagagatg atagagggac gattgcgtgc aactcttaat 1140
ggtatatcat acttacctcc tgcaacaccc ctaaagcttg ctcagcaata caacatctca 1200
ggggtatata agttggattt cccaaaaagg ccaatgaata ggcaccccag ggttgatacc 1260
tcagtcataa acggcacgtt caagggattc gtggaaatca tatttcaaaa tagtgacacc 1320
actgttaaga gctaccactt ggatgggttat gcattttttg ttgttgggat ggactttggt 1380
ctgtggacag aaaatagcag aagcacatac aacaagggtg atgcagttgc tcgatctact 1440
acgcaggtgt ttcttggtgc atggacggcc gtcttggttt ctttggacaa tgctggcatg 1500
tggaaccttc gaatagacaa tctagcctca tgggtatcttg gccaaagaact atacttgagt 1560
gtggttaatc cagagattga cattgactca tctgagaatt ccgttcctaa aaactctata 1620
tattgtggtc ggctctcacc attacaaaag taa 1653

<210> 54

<211> 550

<212> PRT

<213> Arabidopsis thaliana

<400> 54

Met Arg Cys Phe Pro Pro Pro Leu Trp Cys Thr Ser Leu Val Val Phe
 1 5 10 15

Leu Ser Val Thr Gly Ala Leu Ala Ala Asp Pro Tyr Val Phe Phe Asp
 20 25 30

Trp Thr Val Ser Tyr Leu Ser Ala Ser Pro Leu Gly Thr Arg Gln Gln
 35 40 45

Val Ile Gly Ile Asn Gly Gln Phe Pro Gly Pro Ile Leu Asn Val Thr
 50 55 60

Thr Asn Trp Asn Val Val Met Asn Val Lys Asn Asn Leu Asp Glu Pro
 65 70 75 80

Leu Leu Leu Thr Trp Asn Gly Ile Gln His Arg Lys Asn Ser Trp Gln
 85 90 95

Asp Gly Val Leu Gly Thr Asn Cys Pro Ile Pro Ser Gly Trp Asn Trp
 100 105 110

Thr Tyr Glu Phe Gln Val Lys Asp Gln Ile Gly Ser Phe Phe Tyr Phe
 115 120 125

Pro Ser Thr Asn Phe Gln Arg Ala Ser Gly Gly Tyr Gly Gly Ile Ile
 130 135 140

Val Asn Asn Arg Ala Ile Ile Pro Val Pro Phe Ala Leu Pro Asp Gly
 145 150 155 160

Asp Val Thr Leu Phe Ile Ser Asp Trp Tyr Thr Lys Ser His Lys Lys
 165 170 175

Leu Arg Lys Asp Val Glu Ser Lys Asn Gly Leu Arg Pro Pro Asp Gly
 180 185 190

Ile Val Ile Asn Gly Phe Gly Pro Phe Ala Ser Asn Gly Ser Pro Phe
 195 200 205

61/121

Gly Thr Ile Asn Val Glu Pro Gly Arg Thr Tyr Arg Phe Arg Val His
210 215 220

Asn Ser Gly Ile Ala Thr Ser Leu Asn Phe Arg Ile Gln Asn His Asn
225 230 235 240

Leu Leu Leu Val Glu Thr Glu Gly Ser Tyr Thr Ile Gln Gln Asn Tyr
245 250 255

Thr Asn Met Asp Ile His Val Gly Gln Ser Phe Ser Phe Leu Val Thr
260 265 270

Met Asp Gln Ser Gly Ser Asn Asp Tyr Tyr Ile Val Ala Ser Pro Arg
275 280 285

Phe Ala Thr Ser Ile Lys Ala Ser Gly Val Ala Val Leu Arg Tyr Ser
290 295 300

Asn Ser Gln Gly Pro Ala Ser Gly Pro Leu Pro Asp Pro Pro Ile Glu
305 310 315 320

Leu Asp Thr Phe Phe Ser Met Asn Gln Ala Arg Ser Leu Arg Leu Asn
325 330 335

Leu Ser Ser Gly Ala Ala Arg Pro Asn Pro Gln Gly Ser Phe Lys Tyr
340 345 350

Gly Gln Ile Thr Val Thr Asp Val Tyr Val Ile Val Asn Arg Pro Pro
355 360 365

Glu Met Ile Glu Gly Arg Leu Arg Ala Thr Leu Asn Gly Ile Ser Tyr
370 375 380

Leu Pro Pro Ala Thr Pro Leu Lys Leu Ala Gln Gln Tyr Asn Ile Ser
385 390 395 400

Gly Val Tyr Lys Leu Asp Phe Pro Lys Arg Pro Met Asn Arg His Pro
405 410 415

Arg Val Asp Thr Ser Val Ile Asn Gly Thr Phe Lys Gly Phe Val Glu
420 425 430

Ile Ile Phe Gln Asn Ser Asp Thr Thr Val Lys Ser Tyr His Leu Asp
435 440 445

Gly Tyr Ala Phe Phe Val Val Gly Met Asp Phe Gly Leu Trp Thr Glu
 450 455 460

Asn Ser Arg Ser Thr Tyr Asn Lys Gly Asp Ala Val Ala Arg Ser Thr
 465 470 475 480

Thr Gln Val Phe Pro Gly Ala Trp Thr Ala Val Leu Val Ser Leu Asp
 485 490 495

Asn Ala Gly Met Trp Asn Leu Arg Ile Asp Asn Leu Ala Ser Trp Tyr
 500 505 510

Leu Gly Gln Glu Leu Tyr Leu Ser Val Val Asn Pro Glu Ile Asp Ile
 515 520 525

Asp Ser Ser Glu Asn Ser Val Pro Lys Asn Ser Ile Tyr Cys Gly Arg
 530 535 540

Leu Ser Pro Leu Gln Lys
 545 550

<210> 55

<211> 615

<212> DNA

<213> Arabidopsis thaliana

<400> 55

atgcttctaa ttctagegat ttggtcacca atttcacact cgcttcactt cgatctacac	60
tcagggtcgca caaagtgtat cgccgaagac atcaaaagca attcaatgac tggttggtaaa	120
tacaacatcg ataatcctca cgaagggtcaa gctttaccac aaactcacia aatttcctgc	180
aagggtgacgt ctaattccgg taacaattac catcacgcgg aacaagtaga ttcaggacaa	240
ttcgcatctt cggctgttga agcaggtgat tacatggctt gtttcactgc tgttgatcat	300
aagcctgagg tttcgttgag tattgacttt gagtggaaga ctggtgttca atctaaaagc	360
tgggctaattg ttgctaagaa gagtcaagtc gaagttatgg aatttgaagt aaagagtctt	420
cttgatactg ttaactcgat tcatgaagag atgtattatc ttagagatag ggaagaagag	480
atgcaagact tgaaccggtc cactaacaca aaaatggcgt gggttgagtgt tctctcgttt	540
ttcgtctgca taggagttgc agggatgcag tttttgcact tgaagacgtt tttcgagaag	600
aagaagggtta tctga	615

<210> 56

<211> 204

<212> PRT

<213> Arabidopsis thaliana

<400> 56

Met Leu Leu Ile Leu Ala Ile Trp Ser Pro Ile Ser His Ser Leu His
 1 5 10 15

Phe Asp Leu His Ser Gly Arg Thr Lys Cys Ile Ala Glu Asp Ile Lys
 20 25 30

Ser Asn Ser Met Thr Val Gly Lys Tyr Asn Ile Asp Asn Pro His Glu
 35 40 45

Gly Gln Ala Leu Pro Gln Thr His Lys Ile Ser Val Lys Val Thr Ser
 50 55 60

Asn Ser Gly Asn Asn Tyr His His Ala Glu Gln Val Asp Ser Gly Gln
 65 70 75 80

Phe Ala Phe Ser Ala Val Glu Ala Gly Asp Tyr Met Ala Cys Phe Thr
 85 90 95

Ala Val Asp His Lys Pro Glu Val Ser Leu Ser Ile Asp Phe Glu Trp
 100 105 110

Lys Thr Gly Val Gln Ser Lys Ser Trp Ala Asn Val Ala Lys Lys Ser
 115 120 125

Gln Val Glu Val Met Glu Phe Glu Val Lys Ser Leu Leu Asp Thr Val
 130 135 140

Asn Ser Ile His Glu Glu Met Tyr Tyr Leu Arg Asp Arg Glu Glu Glu
 145 150 155 160

Met Gln Asp Leu Asn Arg Ser Thr Asn Thr Lys Met Ala Trp Leu Ser
 165 170 175

Val Leu Ser Phe Phe Val Cys Ile Gly Val Ala Gly Met Gln Phe Leu
 180 185 190

His Leu Lys Thr Phe Phe Glu Lys Lys Lys Val Ile
 195 200

<210> 57
 <211> 969
 <212> DNA
 <213> Arabidopsis thaliana

<400> 57
 atggcacatg ccacgtttac gtcggaaggg cagaatatgg agtcgtttcg actcttgagt 60
 ggccacaaaa tcccagccgt tggactcggc acgtggcgat ctgggtctca agccgcccac 120
 gccgttgatc ctgcaatcgt cgagggtggc tataggcaca tagatacagc ttgggagtat 180
 ggtgatcaga gagaggctcg tcaaggaata aagagggcga tgcacgctgg ccttgaaagc 240
 agggacctct ttgtgacctc gaagctttgg tgcactgagt tatctcctga gagagtgcgt 300
 cctgctctgc aaaacaccct taaagagctt caattagagt accttgatct ctacttgatt 360
 cactggccta tccggctaag agaaggagcc agtaagccac caaaggcagg ggacgttctt 420
 gactttgaca tggaaggagt ttggagagaa atggagaatc tttccaagga cagtctcgtc 480
 aggaatatcg gtgtctgtaa ctttacagtc actaagctca ataagctgct aggatttgct 540
 gaactgatcc ctgccgtttg ccagatggaa atgcacctcg gttggagaaa cgataggata 600
 ctgcaattct gcaagaagaa tgagatccat gttactgcct attctccatt gggatctcaa 660
 gaaggcggga gagatctgat acacgatcag acggtggata ggatagcgaa gaagctgaat 720
 aagacaccgg gacagattct agtgaaatgg ggtttgcaga gaggaacaag tgtcatccct 780
 aagtcattga atccagagag gatcaaagag aacatcaaag tgtttgattg ggtgatccct 840
 gaacaagact tccaagctct caacagcatc actgaccaga aacgagtgat agacggtgag 900
 gatcttttcg tcaacaagac cgaagggtcca ttccgtagtg tggctgatct atggggaccat 960
 gaagactaa 969

<210> 58
 <211> 322
 <212> PRT
 <213> Arabidopsis thaliana

<400> 58
 Met Ala His Ala Thr Phe Thr Ser Glu Gly Gln Asn Met Glu Ser Phe
 1 5 10 15
 Arg Leu Leu Ser Gly His Lys Ile Pro Ala Val Gly Leu Gly Thr Trp
 20 25 30
 Arg Ser Gly Ser Gln Ala Ala His Ala Val Val Thr Ala Ile Val Glu
 35 40 45

Gly Gly Tyr Arg His Ile Asp Thr Ala Trp Glu Tyr Gly Asp Gln Arg
 50 55 60

Glu Val Gly Gln Gly Ile Lys Arg Ala Met His Ala Gly Leu Glu Arg
 65 70 75 80

Arg Asp Leu Phe Val Thr Ser Lys Leu Trp Cys Thr Glu Leu Ser Pro
 85 90 95

Glu Arg Val Arg Pro Ala Leu Gln Asn Thr Leu Lys Glu Leu Gln Leu
 100 105 110

Glu Tyr Leu Asp Leu Tyr Leu Ile His Trp Pro Ile Arg Leu Arg Glu
 115 120 125

Gly Ala Ser Lys Pro Pro Lys Ala Gly Asp Val Leu Asp Phe Asp Met
 130 135 140

Glu Gly Val Trp Arg Glu Met Glu Asn Leu Ser Lys Asp Ser Leu Val
 145 150 155 160

Arg Asn Ile Gly Val Cys Asn Phe Thr Val Thr Lys Leu Asn Lys Leu
 165 170 175

Leu Gly Phe Ala Glu Leu Ile Pro Ala Val Cys Gln Met Glu Met His
 180 185 190

Pro Gly Trp Arg Asn Asp Arg Ile Leu Glu Phe Cys Lys Lys Asn Glu
 195 200 205

Ile His Val Thr Ala Tyr Ser Pro Leu Gly Ser Gln Glu Gly Gly Arg
 210 215 220

Asp Leu Ile His Asp Gln Thr Val Asp Arg Ile Ala Lys Lys Leu Asn
 225 230 235 240

Lys Thr Pro Gly Gln Ile Leu Val Lys Trp Gly Leu Gln Arg Gly Thr
 245 250 255

Ser Val Ile Pro Lys Ser Leu Asn Pro Glu Arg Ile Lys Glu Asn Ile
 260 265 270

66/121

Lys Val Phe Asp Trp Val Ile Pro Glu Gln Asp Phe Gln Ala Leu Asn
275 280 285

Ser Ile Thr Asp Gln Lys Arg Val Ile Asp Gly Glu Asp Leu Phe Val
290 295 300

Asn Lys Thr Glu Gly Pro Phe Arg Ser Val Ala Asp Leu Trp Asp His
305 310 315 320

Glu Asp

<210> 59

<211> 867

<212> DNA

<213> Arabidopsis thaliana

<400> 59

atggcgctctg agaaacaaaa acaacatgca caacctggca aagaacatgt catggaatca	60
agcccacaat tctctagctc agattaccaa ccttccaaca agcttcgtgg taaggtggcg	120
ttgataactg gtggagactc tgggattggg cgagccgtgg gatactgttt tgcattccgaa	180
ggagctactg tggctttcac ttacgtgaag ggtcaagaag aaaaagatgc acaagagacc	240
ctacaaatgt tgaaggaggt caaaacctcg gactccaagg aacctatcgc cattccaacg	300
gatttaggat ttgacgaaaa ctgcaaaagg gtcgttgatg aggtcggttaa tgcttttggc	360
cgcacatgatg ttttgatcaa taacgcagca gagcagtagc agagcagcac aatcgaagag	420
attgatgagc ctaggcttga gcgagtcttc cgtacaaaca tcttttctta cttctttctc	480
acaaggcatg cgttgaagca tatgaaggaa ggaagcagca ttatcaacac cacttcggtg	540
aatgcctaca agggaaacgc ttcacttctc gactacaccg ctacaaaagg agcgattgtg	600
gcgtttactc gaggacttgc acttcagcta gctgagaaag gaatccgtgt caatggtgtg	660
gctcctgggc caatatggac accccttacc ccagcatcat tcaatgagga gaagattaag	720
aattttgggt ctgaggttcc gatgaaaaga gcgggtcagc caattgaagt ggcaccatcc	780
tatgttttct tggcgtgtaa ccactgctct tcttacttca ctggtcaagt tcttcaccct	840
aatggaggag ctgtggtaaa tgcgtaa	867

<210> 60

<211> 288

<212> PRT

<213> Arabidopsis thaliana

67/121

<400> 60

Met Ala Ser Glu Lys Gln Lys Gln His Ala Gln Pro Gly Lys Glu His
1 5 10 15

Val Met Glu Ser Ser Pro Gln Phe Ser Ser Ser Asp Tyr Gln Pro Ser
20 25 30

Asn Lys Leu Arg Gly Lys Val Ala Leu Ile Thr Gly Gly Asp Ser Gly
35 40 45

Ile Gly Arg Ala Val Gly Tyr Cys Phe Ala Ser Glu Gly Ala Thr Val
50 55 60

Ala Phe Thr Tyr Val Lys Gly Gln Glu Glu Lys Asp Ala Gln Glu Thr
65 70 75 80

Leu Gln Met Leu Lys Glu Val Lys Thr Ser Asp Ser Lys Glu Pro Ile
85 90 95

Ala Ile Pro Thr Asp Leu Gly Phe Asp Glu Asn Cys Lys Arg Val Val
100 105 110

Asp Glu Val Val Asn Ala Phe Gly Arg Ile Asp Val Leu Ile Asn Asn
115 120 125

Ala Ala Glu Gln Tyr Glu Ser Ser Thr Ile Glu Glu Ile Asp Glu Pro
130 135 140

Arg Leu Glu Arg Val Phe Arg Thr Asn Ile Phe Ser Tyr Phe Phe Leu
145 150 155 160

Thr Arg His Ala Leu Lys His Met Lys Glu Gly Ser Ser Ile Ile Asn
165 170 175

Thr Thr Ser Val Asn Ala Tyr Lys Gly Asn Ala Ser Leu Leu Asp Tyr
180 185 190

Thr Ala Thr Lys Gly Ala Ile Val Ala Phe Thr Arg Gly Leu Ala Leu
195 200 205

Gln Leu Ala Glu Lys Gly Ile Arg Val Asn Gly Val Ala Pro Gly Pro
210 215 220

Ile Trp Thr Pro Leu Ile Pro Ala Ser Phe Asn Glu Glu Lys Ile Lys
 225 230 235 240

Asn Phe Gly Ser Glu Val Pro Met Lys Arg Ala Gly Gln Pro Ile Glu
 245 250 255

Val Ala Pro Ser Tyr Val Phe Leu Ala Cys Asn His Cys Ser Ser Tyr
 260 265 270

Phe Thr Gly Gln Val Leu His Pro Asn Gly Gly Ala Val Val Asn Ala
 275 280 285

<210> 61

<211> 1326

<212> DNA

<213> Arabidopsis thaliana

<400> 61

atggattcaa cgaagcttag tgagctaaag gtcttcacg atcaatgcaa gtctgaccct	60
tcccttctca ctactccttc actctccttc ttccgtgact atctcgagag tcttggtgct	120
aagataccta ctggtgtcca tgaagaagac aaagacacta agccgaggag ttctgtagtg	180
gaagagagtg atgatgatat ggatgaaact gaagaagtaa aaccgaaagt ggaggaagaa	240
gaagaagagg atgagattgt tgaatctgat gtagagcttg aaggagacac tggtgagcct	300
gataatgatc ctctcagaa gatgggggat tcatcagtgg aggtgactga tgagaatcgt	360
gaagctgctc aagaagctaa gggcaaagcc atggaggccc tttctgaagg aaactttgat	420
gaagcaattg agcatttaac tcgggcaata acgttgaacc cgacttcagc tattatgtat	480
ggaaacagag ctagtgtcta cattaagttg aagaagccaa acgctgctat tcgagatgca	540
aacgcagcat tggagattaa ccctgattct gccaagggat acaagtcacg aggtatggct	600
cgtgccatgc ttggagaatg ggcagaggct gcaaaagacc ttcaccttgc atctacgata	660
gactatgatg aggaaattag tgctgttctc aaaaagggtg aacctaatgc acataagctt	720
gaggagcacc gtagaaagta tgacagatta cgtaaggaaa gagaggacaa aaaggctgaa	780
cgggatagat tacgtgcgcg tgctgaagca caggctgcct atgataaagc taagaaagaa	840
gaacagtcac catctagcag accatcagga ggcggtttcc caggaggtat gcccggtggt	900
ttcccaggag gtatgcccg tggtattcca ggaggaatgg gaggcacgcc cggcggtatc	960
ccgggaggaa tgggtggtat gggcggtatg cccggtggat tcccaggagg aatgggcggt	1020
ggtatgcctg caggaatggg cggtggtatg cccggaatgg gcggtggtat gcctgctgga	1080

69/121

atgggtggtg gcggtatgcc aggtgcaggc ggtggtatgc ctggtggtgg cggtatgcct 1140
ggtggtatgg acttcagcaa aatattgaat gatcctgagc taatgacggc atttagcgac 1200
cctgaagtca tggctgctct tcaagatgtg atgaagaacc ctgcgaatct agcgaagcat 1260
caggcgaatc cgaaggtggc tcccgtgatt gcaaagatga tgggcaaatt tgcaggacct 1320
cagtaa 1326

<210> 62
<211> 441
<212> PRT
<213> Arabidopsis thaliana

<400> 62

Met Asp Ser Thr Lys Leu Ser Glu Leu Lys Val Phe Ile Asp Gln Cys
1 5 10 15

Lys Ser Asp Pro Ser Leu Leu Thr Thr Pro Ser Leu Ser Phe Phe Arg
20 25 30

Asp Tyr Leu Glu Ser Leu Gly Ala Lys Ile Pro Thr Gly Val His Glu
35 40 45

Glu Asp Lys Asp Thr Lys Pro Arg Ser Phe Val Val Glu Glu Ser Asp
50 55 60

Asp Asp Met Asp Glu Thr Glu Glu Val Lys Pro Lys Val Glu Glu Glu
65 70 75 80

Glu Glu Glu Asp Glu Ile Val Glu Ser Asp Val Glu Leu Glu Gly Asp
85 90 95

Thr Val Glu Pro Asp Asn Asp Pro Pro Gln Lys Met Gly Asp Ser Ser
100 105 110

Val Glu Val Thr Asp Glu Asn Arg Glu Ala Ala Gln Glu Ala Lys Gly
115 120 125

Lys Ala Met Glu Ala Leu Ser Glu Gly Asn Phe Asp Glu Ala Ile Glu
130 135 140

His Leu Thr Arg Ala Ile Thr Leu Asn Pro Thr Ser Ala Ile Met Tyr
145 150 155 160

70/121

Gly Asn Arg Ala Ser Val Tyr Ile Lys Leu Lys Lys Pro Asn Ala Ala
165 170 175

Ile Arg Asp Ala Asn Ala Ala Leu Glu Ile Asn Pro Asp Ser Ala Lys
180 185 190

Gly Tyr Lys Ser Arg Gly Met Ala Arg Ala Met Leu Gly Glu Trp Ala
195 200 205

Glu Ala Ala Lys Asp Leu His Leu Ala Ser Thr Ile Asp Tyr Asp Glu
210 215 220

Glu Ile Ser Ala Val Leu Lys Lys Val Glu Pro Asn Ala His Lys Leu
225 230 235 240

Glu Glu His Arg Arg Lys Tyr Asp Arg Leu Arg Lys Glu Arg Glu Asp
245 250 255

Lys Lys Ala Glu Arg Asp Arg Leu Arg Arg Arg Ala Glu Ala Gln Ala
260 265 270

Ala Tyr Asp Lys Ala Lys Lys Glu Glu Gln Ser Ser Ser Ser Arg Pro
275 280 285

Ser Gly Gly Gly Phe Pro Gly Gly Met Pro Gly Gly Phe Pro Gly Gly
290 295 300

Met Pro Gly Gly Phe Pro Gly Gly Met Gly Gly Met Pro Gly Gly Phe
305 310 315 320

Pro Gly Gly Met Gly Gly Met Gly Gly Met Pro Gly Gly Phe Pro Gly
325 330 335

Gly Met Gly Gly Gly Met Pro Ala Gly Met Gly Gly Gly Met Pro Gly
340 345 350

Met Gly Gly Gly Met Pro Ala Gly Met Gly Gly Gly Gly Met Pro Gly
355 360 365

Ala Gly Gly Gly Met Pro Gly Gly Gly Gly Met Pro Gly Gly Met Asp
370 375 380

Phe Ser Lys Ile Leu Asn Asp Pro Glu Leu Met Thr Ala Phe Ser Asp
385 390 395 400

Pro Glu Val Met Ala Ala Leu Gln Asp Val Met Lys Asn Pro Ala Asn
 405 410 415

Leu Ala Lys His Gln Ala Asn Pro Lys Val Ala Pro Val Ile Ala Lys
 420 425 430

Met Met Gly Lys Phe Ala Gly Pro Gln
 435 440

<210> 63

<211> 2448

<212> DNA

<213> Arabidopsis thaliana

<400> 63

atgaagggtc acgagacaag atctcacgct cacatgtctg gagacgaaca aaagaaggga	60
aatttgcgga agcacaaagc agaagggaaa cttccagaat ctgaacagtc tcagaagaag	120
gcaaagcctg aaaacgatga cggacgttct gtcaacggcg ccggagatgc tgcttcagag	180
tacaatgagt tctgcaaagc gggtgaggag aatctgtcca ttgatcagat taaagaagtt	240
ctcgaaatca acggccaaga ttgttctgct ccagaagaga ccttgctagc tcaatgtcaa	300
gatttgctgt tctatggggc attagctaaa tgtcctttat gcggagggaac tttaatattgc	360
gacaatgaaa agagatttgt atgtggagggt gagataagtg agtgggtgcag ttgcgtgttt	420
agtacgaaag atcctcctag aaaggaagag ccagttaaaa tccctgattc tgtcatgaac	480
tctgctatat ctgacttgat caagaaacac caggacccta aaagccgacc taaaagagag	540
ttaggctctg ctgataaacc ctttgtggga atgatgatct ctctcatggg acgtctcacg	600
agaacacatc aatattggaa gaaaaagatc gagagaaacg gtgggaaagt ctccaatact	660
gttcaaggcg taacatgttt ggtggtttcg ccagctgaaa gagaacgagg tggtagctca	720
aagatggtgg aggcaatgga acaaggtcta ccggttgatg gcgaagcatg gttgatcgac	780
agcgtggaga agcatgaagc tcagccactt gaagcttatg acgtggtcag tgatctttca	840
gtggaaggga aaggaattcc atgggataag caagatccta gtgaggaggc aattgaatcc	900
ttttctgctg agctcaaaat gtatgggaaa agaggagtgt acatggacac aaaacttcag	960
gagagaggag gaaagatctt cgagaaagat ggactcttgt ataactgtgc cttctcgata	1020
tgcgatttgg gaaaagggcg taatgagtat tgtattatgc agctagtcac ggtacccgat	1080
agtaacctga acatgtactt caagagaggg aaagtaggag atgaccctaa tgccgaagag	1140


```

aggctcgagg aatgggagga cgaagaagct gcgatcaaag agtttgcaag gctttttgag 1200
gagatagcag ggaatgagtt tgagccatgg gaacgtgaga agaagattca aaagaagcct 1260
cataagtttt tccaattga tatggatgat ggaatcgaag taaggagtgg ggctcttggt 1320
ctaaggcagc ttggcattgc ttctgctcat tgcaagcttg attcgtttgt tgcaaacttc 1380
attaaagttc tgtgtggtca agagatttac aattacgcgt tgatggagct tggattggat 1440
ccgcccgatc tacctatggg aatgctaact gatatccact tgaaacgatg cgaagaggta 1500
ttactcgagt ttgttgagaa ggtcaaaaaca acaaaagaga caggtcagaa agctgaagca 1560
atgtgggcag acttcagctc acgatgggtc tctttgatgc acagcactag gccgatgcga 1620
ttacacgatg tcaatgaact tgcagaccat gcggcctctg cttttgagac ggtgaggggac 1680
ataaacacag catctcgttt gataggggac atgcgaggag acacactcga tgatccgttg 1740
tctgataggt acaaaaaaact tggctgcaag atatctgtgg tagacaaaga gtctgaagat 1800
tacaagatgg ttgtgaagta tctcgagact acttatgagc ctgtgaaagt ctctgatgtt 1860
gagtacgggtg tgtcagtgca gaatgttttt gcggttgagt cagatgcaat tccttcatta 1920
gatgatatca agaagttacc aaataaggtc cttttatggt gtgggtctcg gagctcaaat 1980
ctattgagac atatctacaa agggttctta cctgctgtat gctctcttcc ggttcctggt 2040
tatatgtttg ggagagcgat agtgtgttca gatgcagctg cagaagcagc aaggatatggt 2100
tttacggctg tggatagacc agaagggttt cttgtattag ccgtagcatc acttggtgag 2160
gaagttacag aatttacaag tccaccagag gatacgaaga cgttggaaga taaaaagatt 2220
ggagtgaag gattagggag gaagaaaact gaagagtcgg agcatttcat gtggagagat 2280
gacataaaag ttccttgtgg acggttggtt ccacggaac ataaggacag tccacttgag 2340
tacaacgagt acgcggttta tgatccgaaa cagacaagta taaggttctt ggtggaagtg 2400
aagtacgagg agaagggaac tgagatagtc gatgtcgaac cagagtag 2448

```

<210> 64

<211> 815

<212> PRT

<213> Arabidopsis thaliana

<400> 64

```

Met Lys Val His Glu Thr Arg Ser His Ala His Met Ser Gly Asp Glu
1           5           10           15

```

```

Gln Lys Lys Gly Asn Leu Arg Lys His Lys Ala Glu Gly Lys Leu Pro
20           25           30

```

Glu Ser Glu Gln Ser Gln Lys Lys Ala Lys Pro Glu Asn Asp Asp Gly
 35 40 45
 Arg Ser Val Asn Gly Ala Gly Asp Ala Ala Ser Glu Tyr Asn Glu Phe
 50 55 60
 Cys Lys Ala Val Glu Glu Asn Leu Ser Ile Asp Gln Ile Lys Glu Val
 65 70 75 80
 Leu Glu Ile Asn Gly Gln Asp Cys Ser Ala Pro Glu Glu Thr Leu Leu
 85 90 95
 Ala Gln Cys Gln Asp Leu Leu Phe Tyr Gly Ala Leu Ala Lys Cys Pro
 100 105 110
 Leu Cys Gly Gly Thr Leu Ile Cys Asp Asn Glu Lys Arg Phe Val Cys
 115 120 125
 Gly Gly Glu Ile Ser Glu Trp Cys Ser Cys Val Phe Ser Thr Lys Asp
 130 135 140
 Pro Pro Arg Lys Glu Glu Pro Val Lys Ile Pro Asp Ser Val Met Asn
 145 150 155 160
 Ser Ala Ile Ser Asp Leu Ile Lys Lys His Gln Asp Pro Lys Ser Arg
 165 170 175
 Pro Lys Arg Glu Leu Gly Ser Ala Asp Lys Pro Phe Val Gly Met Met
 180 185 190
 Ile Ser Leu Met Gly Arg Leu Thr Arg Thr His Gln Tyr Trp Lys Lys
 195 200 205
 Lys Ile Glu Arg Asn Gly Gly Lys Val Ser Asn Thr Val Gln Gly Val
 210 215 220
 Thr Cys Leu Val Val Ser Pro Ala Glu Arg Glu Arg Gly Gly Thr Ser
 225 230 235 240
 Lys Met Val Glu Ala Met Glu Gln Gly Leu Pro Val Val Ser Glu Ala
 245 250 255

Trp Leu Ile Asp Ser Val Glu Lys His Glu Ala Gln Pro Leu Glu Ala
 260 265 270

Tyr Asp Val Val Ser Asp Leu Ser Val Glu Gly Lys Gly Ile Pro Trp
 275 280 285

Asp Lys Gln Asp Pro Ser Glu Glu Ala Ile Glu Ser Phe Ser Ala Glu
 290 295 300

Leu Lys Met Tyr Gly Lys Arg Gly Val Tyr Met Asp Thr Lys Leu Gln
 305 310 315 320

Glu Arg Gly Gly Lys Ile Phe Glu Lys Asp Gly Leu Leu Tyr Asn Cys
 325 330 335

Ala Phe Ser Ile Cys Asp Leu Gly Lys Gly Arg Asn Glu Tyr Cys Ile
 340 345 350

Met Gln Leu Val Thr Val Pro Asp Ser Asn Leu Asn Met Tyr Phe Lys
 355 360 365

Arg Gly Lys Val Gly Asp Asp Pro Asn Ala Glu Glu Arg Leu Glu Glu
 370 375 380

Trp Glu Asp Glu Glu Ala Ala Ile Lys Glu Phe Ala Arg Leu Phe Glu
 385 390 395 400

Glu Ile Ala Gly Asn Glu Phe Glu Pro Trp Glu Arg Glu Lys Lys Ile
 405 410 415

Gln Lys Lys Pro His Lys Phe Phe Pro Ile Asp Met Asp Asp Gly Ile
 420 425 430

Glu Val Arg Ser Gly Ala Leu Gly Leu Arg Gln Leu Gly Ile Ala Ser
 435 440 445

Ala His Cys Lys Leu Asp Ser Phe Val Ala Asn Phe Ile Lys Val Leu
 450 455 460

Cys Gly Gln Glu Ile Tyr Asn Tyr Ala Leu Met Glu Leu Gly Leu Asp
 465 470 475 480

Pro Pro Asp Leu Pro Met Gly Met Leu Thr Asp Ile His Leu Lys Arg
 485 490 495

Cys Glu Glu Val Leu Leu Glu Phe Val Glu Lys Val Lys Thr Thr Lys
 500 505 510

Glu Thr Gly Gln Lys Ala Glu Ala Met Trp Ala Asp Phe Ser Ser Arg
 515 520 525

Trp Phe Ser Leu Met His Ser Thr Arg Pro Met Arg Leu His Asp Val
 530 535 540

Asn Glu Leu Ala Asp His Ala Ala Ser Ala Phe Glu Thr Val Arg Asp
 545 550 555 560

Ile Asn Thr Ala Ser Arg Leu Ile Gly Asp Met Arg Gly Asp Thr Leu
 565 570 575

Asp Asp Pro Leu Ser Asp Arg Tyr Lys Lys Leu Gly Cys Lys Ile Ser
 580 585 590

Val Val Asp Lys Glu Ser Glu Asp Tyr Lys Met Val Val Lys Tyr Leu
 595 600 605

Glu Thr Thr Tyr Glu Pro Val Lys Val Ser Asp Val Glu Tyr Gly Val
 610 615 620

Ser Val Gln Asn Val Phe Ala Val Glu Ser Asp Ala Ile Pro Ser Leu
 625 630 635 640

Asp Asp Ile Lys Lys Leu Pro Asn Lys Val Leu Leu Trp Cys Gly Ser
 645 650 655

Arg Ser Ser Asn Leu Leu Arg His Ile Tyr Lys Gly Phe Leu Pro Ala
 660 665 670

Val Cys Ser Leu Pro Val Pro Gly Tyr Met Phe Gly Arg Ala Ile Val
 675 680 685

Cys Ser Asp Ala Ala Ala Glu Ala Ala Arg Tyr Gly Phe Thr Ala Val
 690 695 700

Asp Arg Pro Glu Gly Phe Leu Val Leu Ala Val Ala Ser Leu Gly Glu
 705 710 715 720

76/121

Glu Val Thr Glu Phe Thr Ser Pro Pro Glu Asp Thr Lys Thr Leu Glu
725 730 735

Asp Lys Lys Ile Gly Val Lys Gly Leu Gly Arg Lys Lys Thr Glu Glu
740 745 750

Ser Glu His Phe Met Trp Arg Asp Asp Ile Lys Val Pro Cys Gly Arg
755 760 765

Leu Val Pro Ser Glu His Lys Asp Ser Pro Leu Glu Tyr Asn Glu Tyr
770 775 780

Ala Val Tyr Asp Pro Lys Gln Thr Ser Ile Arg Phe Leu Val Glu Val
785 790 795 800

Lys Tyr Glu Glu Lys Gly Thr Glu Ile Val Asp Val Glu Pro Glu
805 810 815

<210> 65

<211> 2430

<212> DNA

<213> Arabidopsis thaliana

<400> 65

atgtctaccc cagctgaatc ttcagactcg aaatcgaaga aagatttcag tactgctatt	60
ctcgagagga agaagtctcc gaaccgtctc gtcgtcgatg aggtatcaa cgatgataac	120
tccgtcgtct ctcttcaccc tgcaaccatg gagaagcttc agctcttcg tggtgatacc	180
attctcatca agggtaagaa gaggaaggac actgtctgca ttgctcttgc tgatgagaca	240
tgtgaggagc caaagatcag aatgaataaa gtagtcagat ctaacttgag ggtagactg	300
ggagatgtta tatctgttca ccaatgccc gacgtcaagt acggaaagcg tgttcacatc	360
ctgcctgttg atgatactgt tgaaggagtg actggaaacc tatttgatgc ttacctgaaa	420
ccttatttcc ttgaggcata ccgtccagtg aggaagggtg atctcttcct agtcagagga	480
ggaatgagga gtgtggagtt caaagttata gagacagatc ctgctgagta ctgcgtggtt	540
gctccagaca cagagatttt ctgtgagggt gagcctgtga agagagagga tgaagaaagg	600
ctagatgatg taggttatga tgatgttggt ggtgtcagga aacagatggc tcagattagg	660
gaacttggtg aacttccctt gaggcaccca cagctattca agtcgattgg tgtaaagcca	720
ccgaagggaa ttcttcttta tggaccacct gggctctggaa agactttgat cgctcgtgct	780
gtggctaata aaacgggtgc ctttttcttc tgtatcaacg gacctgagat catgtccaaa	840

ttggctggtg	agagtgaag	caacctcagg	aaagcattcg	aggaggctga	gaaaaatgcg	900
ccttcaatca	tattcattga	tgagatcgac	tctattgcac	cgaaaagaga	gaagactaat	960
ggagagggtg	agaggaggat	tgtctctcag	ctccttacgc	taatggatgg	actgaaatct	1020
cgtgctcatg	ttatcgtc	gggagcaacc	aatcgcccca	acagtatcga	cccagctttg	1080
agaaggtttg	gaagatttga	cagggagatc	gatattggag	ttcctgacga	aattggacgt	1140
cttgaagttc	tgaggatcca	tacaaagaac	atgaagctgg	ctgaagatgt	ggatctcgaa	1200
aggatctcaa	aggacacaca	cggttacgtc	ggtgctgac	ttgcagcttt	gtgcacagag	1260
gccgccctgc	aatgcatcag	ggagaagatg	gatgtgattg	atctggaaga	tgactccata	1320
gacgtgaaa	tcctcaattc	catggcagtc	actaatgaac	atttcacac	tgctctcggy	1380
aacagcaacc	catctgcact	tcgtgaaact	gttggtggag	ttcccaacgt	ctcttggaat	1440
gatattggag	gtcttgagaa	tgtcaagaga	gagctccagg	agactgttca	ataccagtc	1500
gagcaccag	agaagtttga	gaaattcggg	atgtctccat	caaaggaggt	ccttttctac	1560
ggtcctcctg	gatgtgggaa	aacccttttg	gccaaagcta	ttgccaacga	gtgccaagct	1620
aatttcatca	gtgtcaaggg	tcccagagctt	ctgacaatgt	ggtttgagga	gagtgaagca	1680
aatgttcgtg	aaatcttcga	caaggcccg	caatccgctc	catgtgttct	tttctttgat	1740
gagctcgact	ccattgcaac	tcagagagga	ggtggaagtg	gtggcgatgg	agtggtgtct	1800
gcggacagag	tcttgaacca	gcttttgact	gagatggacg	gaatgaatgc	caagaaaacc	1860
gtcttcatca	tcggagctac	caacagacct	gacattatcg	attcagctct	tctccgtcct	1920
ggaaggcttg	accagctcat	ttacattcca	ctaccagatg	aggattcccc	tctcaatatc	1980
ttcaaggccg	ccttgaggaa	atctcctatt	gctaaagatg	tagacatcgg	tgactttgct	2040
aaatacactc	agggtttcag	tggtgctgat	atcactgaga	tttgccagag	agcttgcaag	2100
tacgccatca	gagaaaacat	tgagaaggac	attgaaaagg	agaagaggag	gagcgagaac	2160
ccagaggcaa	tggaggaaga	tggagtggat	gaagtatcag	agatcaaagc	tgcacacttt	2220
gaggagtcca	tgaagtatgc	gcgtaggagt	gtgagtgatg	cagacatcag	gaagtaccaa	2280
gcctttgctc	agacgttgca	gcagtctaga	gggttcggtt	ctgagttcag	gttcgagaat	2340
tctgctggtt	caggtgccac	cactggagtc	gcagatccgt	ttgccacgct	tgagccgct	2400
gctggggacg	atgatgatct	ctacaattag				2430

<210> 66

<211> 809

<212> PRT

<213> Arabidopsis thaliana

<400> 66

Met Ser Thr Pro Ala Glu Ser Ser Asp Ser Lys Ser Lys Lys Asp Phe
 1 5 10 15

Ser Thr Ala Ile Leu Glu Arg Lys Lys Ser Pro Asn Arg Leu Val Val
 20 25 30

Asp Glu Ala Ile Asn Asp Asp Asn Ser Val Val Ser Leu His Pro Ala
 35 40 45

Thr Met Glu Lys Leu Gln Leu Phe Arg Gly Asp Thr Ile Leu Ile Lys
 50 55 60

Gly Lys Lys Arg Lys Asp Thr Val Cys Ile Ala Leu Ala Asp Glu Thr
 65 70 75 80

Cys Glu Glu Pro Lys Ile Arg Met Asn Lys Val Val Arg Ser Asn Leu
 85 90 95

Arg Val Arg Leu Gly Asp Val Ile Ser Val His Gln Cys Pro Asp Val
 100 105 110

Lys Tyr Gly Lys Arg Val His Ile Leu Pro Val Asp Asp Thr Val Glu
 115 120 125

Gly Val Thr Gly Asn Leu Phe Asp Ala Tyr Leu Lys Pro Tyr Phe Leu
 130 135 140

Glu Ala Tyr Arg Pro Val Arg Lys Gly Asp Leu Phe Leu Val Arg Gly
 145 150 155 160

Gly Met Arg Ser Val Glu Phe Lys Val Ile Glu Thr Asp Pro Ala Glu
 165 170 175

Tyr Cys Val Val Ala Pro Asp Thr Glu Ile Phe Cys Glu Gly Glu Pro
 180 185 190

Val Lys Arg Glu Asp Glu Glu Arg Leu Asp Asp Val Gly Tyr Asp Asp
 195 200 205

Val Gly Gly Val Arg Lys Gln Met Ala Gln Ile Arg Glu Leu Val Glu
 210 215 220

Leu Pro Leu Arg His Pro Gln Leu Phe Lys Ser Ile Gly Val Lys Pro
 225 230 235 240

Pro Lys Gly Ile Leu Leu Tyr Gly Pro Pro Gly Ser Gly Lys Thr Leu
 245 250 255

Ile Ala Arg Ala Val Ala Asn Glu Thr Gly Ala Phe Phe Phe Cys Ile
 260 265 270

Asn Gly Pro Glu Ile Met Ser Lys Leu Ala Gly Glu Ser Glu Ser Asn
 275 280 285

Leu Arg Lys Ala Phe Glu Glu Ala Glu Lys Asn Ala Pro Ser Ile Ile
 290 295 300

Phe Ile Asp Glu Ile Asp Ser Ile Ala Pro Lys Arg Glu Lys Thr Asn
 305 310 315 320

Gly Glu Val Glu Arg Arg Ile Val Ser Gln Leu Leu Thr Leu Met Asp
 325 330 335

Gly Leu Lys Ser Arg Ala His Val Ile Val Met Gly Ala Thr Asn Arg
 340 345 350

Pro Asn Ser Ile Asp Pro Ala Leu Arg Arg Phe Gly Arg Phe Asp Arg
 355 360 365

Glu Ile Asp Ile Gly Val Pro Asp Glu Ile Gly Arg Leu Glu Val Leu
 370 375 380

Arg Ile His Thr Lys Asn Met Lys Leu Ala Glu Asp Val Asp Leu Glu
 385 390 395 400

Arg Ile Ser Lys Asp Thr His Gly Tyr Val Gly Ala Asp Leu Ala Ala
 405 410 415

Leu Cys Thr Glu Ala Ala Leu Gln Cys Ile Arg Glu Lys Met Asp Val
 420 425 430

Ile Asp Leu Glu Asp Asp Ser Ile Asp Ala Glu Ile Leu Asn Ser Met
 435 440 445

80/121

Ala Val Thr Asn Glu His Phe His Thr Ala Leu Gly Asn Ser Asn Pro
450 455 460

Ser Ala Leu Arg Glu Thr Val Val Glu Val Pro Asn Val Ser Trp Asn
465 470 475 480

Asp Ile Gly Gly Leu Glu Asn Val Lys Arg Glu Leu Gln Glu Thr Val
485 490 495

Gln Tyr Pro Val Glu His Pro Glu Lys Phe Glu Lys Phe Gly Met Ser
500 505 510

Pro Ser Lys Gly Val Leu Phe Tyr Gly Pro Pro Gly Cys Gly Lys Thr
515 520 525

Leu Leu Ala Lys Ala Ile Ala Asn Glu Cys Gln Ala Asn Phe Ile Ser
530 535 540

Val Lys Gly Pro Glu Leu Leu Thr Met Trp Phe Gly Glu Ser Glu Ala
545 550 555 560

Asn Val Arg Glu Ile Phe Asp Lys Ala Arg Gln Ser Ala Pro Cys Val
565 570 575

Leu Phe Phe Asp Glu Leu Asp Ser Ile Ala Thr Gln Arg Gly Gly Gly
580 585 590

Ser Gly Gly Asp Gly Gly Gly Ala Ala Asp Arg Val Leu Asn Gln Leu
595 600 605

Leu Thr Glu Met Asp Gly Met Asn Ala Lys Lys Thr Val Phe Ile Ile
610 615 620

Gly Ala Thr Asn Arg Pro Asp Ile Ile Asp Ser Ala Leu Leu Arg Pro
625 630 635 640

Gly Arg Leu Asp Gln Leu Ile Tyr Ile Pro Leu Pro Asp Glu Asp Ser
645 650 655

Arg Leu Asn Ile Phe Lys Ala Ala Leu Arg Lys Ser Pro Ile Ala Lys
660 665 670

Asp Val Asp Ile Gly Ala Leu Ala Lys Tyr Thr Gln Gly Phe Ser Gly
675 680 685

Ala Asp Ile Thr Glu Ile Cys Gln Arg Ala Cys Lys Tyr Ala Ile Arg
690 695 700

Glu Asn Ile Glu Lys Asp Ile Glu Lys Glu Lys Arg Arg Ser Glu Asn
705 710 715 720

Pro Glu Ala Met Glu Glu Asp Gly Val Asp Glu Val Ser Glu Ile Lys
725 730 735

Ala Ala His Phe Glu Glu Ser Met Lys Tyr Ala Arg Arg Ser Val Ser
740 745 750

Asp Ala Asp Ile Arg Lys Tyr Gln Ala Phe Ala Gln Thr Leu Gln Gln
755 760 765

Ser Arg Gly Phe Gly Ser Glu Phe Arg Phe Glu Asn Ser Ala Gly Ser
770 775 780

Gly Ala Thr Thr Gly Val Ala Asp Pro Phe Ala Thr Ser Ala Ala Ala
785 790 795 800

Ala Gly Asp Asp Asp Asp Leu Tyr Asn
805

<210> 67

<211> 2847

<212> DNA

<213> Arabidopsis thaliana

<400> 67

atggacaaat ctagtaccat gcttggtcac tatgacaaag ggactccagc agttgcta	60
gagattaaag aagctctcga aggaaatgat gttgaagcta aagttgatgc catgaagaag	120
gcaattatgc ttttgctgaa tgggtgaaacc attcctcagc ttttcattac cattataaga	180
tatgtgctgc cttctgaaga ccacaccatc caaaagcttc tgttgctgta cctggagctg	240
attgaaaaga cagattcgaa ggggaaggtg ttgcctgaaa tgattttgat atgccagaat	300
cttcgtaata accttcagca tccgaatgag tacatccgtg gagtgacact gaggtttctc	360
tgtcggatga aggagactga aatagtggaa cctttgactc catcagtgtt acaaaatctg	420
gagcatcgcc atccatttgt tcgcaggaat gcaattctgg caatcatgtc gatataataa	480
cttccacatg gcgaccaact cttcgtggat gcacctgaaa tgatcgagaa agttctatca	540

acagaacaag atccttctgc caagagaaat gcattttctaa tgctctttac ctgtgccgaa	600
gaacgtgcag tgaattatct tctgagcaat gttgacaagg tttcagactg gaatgaatca	660
cttcagatgg tggtgctgga gctgattcga agtggtgtga agactaaacc agcggagaag	720
ggaaaatata ttaaaattat tatttctctg ttaagtgcga cttcttctgc agttatctat	780
gaatgtgctg ggacacttgt ttctctctca tctgccccta ctgctattcg agctgctgcc	840
aacacctact gccaaactct tctttctcag agtgacaaca atgtgaagct tatcttgctc	900
gatcggttgt atgagcttaa gacattgcac agagatatca tggttgagct gataatcgat	960
gtgctcagag cactctcaag cccaaacctt gatatccgca ggaagacact tgacattgcc	1020
cttgacttga ttacccatca taatattaat gaagtcgttc aaatggtgaa gaaagaagtt	1080
gtgaagacac agagtggaga acttgagaag aatggagagt acaggcaaata gcttattcaa	1140
gccatccatg cttgtgcagt taagttcccc gaagttgcaa gcacagtggc ccatcttctg	1200
atggatttcc tgggagatag caacgtggct tcagctcttg acgtggttgt tttcgttaga	1260
gagataatag aaacaaatcc caagttgaga gtttcaatca tcaccagggtt gttggacacg	1320
ttctatcaga tccgtgcagg aaaggtctgc ccttggtgcac tttggatcat tggtgagtat	1380
tgctatcac tttcagaagt tgagagtggc atttcaacta ttacacaatg ccttggcgaa	1440
ttaccatttt actctgtttc tgaggagtct gagccaactg agacatcaaa gaagattcag	1500
cctacctctt ctgccatggt gtctcttaga aagccagtta ttcttgctga tggaaacttat	1560
gctacacaaa gcgcagcctc tgaaaccaca ttctcctcgc ctacagttgt tcaaggatca	1620
ctgacttctg gaaatttgag ggcactcctt ctaactggtg attttttcct cggagctgtg	1680
gttgcttgca cgttgaccaa acttgttctt aggttggaag aggttcagtc ttccaaaact	1740
gaagtaaaca agacagtatc acaggctttg ctaatcatgg tttctatttt gcaacttggg	1800
caatctctg tttctccaca cctattgat aatgattcgt atgagcggat tatgttgctg	1860
ataaaattgc tttgccatag gaatgttgag atgaaaaaga tatggttgga atcctgccgc	1920
cagagttttg tcaagatgat ttctgaaaaa cagcttagag agatggagga actgaaggca	1980
aagacccaaa caactcatgc tcaaccggat gatctaattg acttcttcca tctaaagagt	2040
cggaagggaa tgagtcaact tgagttggaa gaccaggtac aagatgacct aaagcgtgca	2100
actggagaat tcaccaagga cgagaacgat gctaacaaac ttaaccgcat tcttcaactc	2160
acaggattca gtgaccagct ctatgctgaa gcatatgtaa cggtagacca ttatgatatt	2220
gctcttgaag ttacagtaat caaccgaacc aaggaaaccc ttcagaactt gtgcttgga	2280

ttagcaacca tgggtgatct caaacttggt gagcgtcctc agaactatag tctggcacct 2340
 gaaagaagca tgcagattaa agcaaacatc aagggtctcgt ccacagagac aggagtcata 2400
 ttcgggaaca tcgtctatga gacatcaaat gtaatggagc gcaatgttgt ggttcttaac 2460
 gacatacaca ttgatatcat ggactatata tcccctgctg tgtgctcaga ggttgctttc 2520
 agaactatgt gggcagagtt tgaatgggaa aacaagggtg ctgtgaacac cacaattcaa 2580
 aacgaaagag aattcctcga ccacattatc aaatccacaa acatgaaatg tctcactgct 2640
 ccatctgcaa tagcaggtga atgtggattc cttgcagcaa acttatatgc aaaaagtgtg 2700
 tttggtgagg atgctcttgt gaatttgagt attgagaagc aaacggatgg aacattgagt 2760
 ggttacataa ggataaggag caagacgcaa gggattgctc taagtcttgg agacaaaatc 2820
 accctcaaac aaaaggtgg tagctga 2847

<210> 68
 <211> 948
 <212> PRT
 <213> Arabidopsis thaliana

<400> 68

Met Asp Lys Ser Ser Thr Met Leu Val His Tyr Asp Lys Gly Thr Pro
 1 5 10 15

Ala Val Ala Asn Glu Ile Lys Glu Ala Leu Glu Gly Asn Asp Val Glu
 20 25 30

Ala Lys Val Asp Ala Met Lys Lys Ala Ile Met Leu Leu Leu Asn Gly
 35 40 45

Glu Thr Ile Pro Gln Leu Phe Ile Thr Ile Ile Arg Tyr Val Leu Pro
 50 55 60

Ser Glu Asp His Thr Ile Gln Lys Leu Leu Leu Leu Tyr Leu Glu Leu
 65 70 75 80

Ile Glu Lys Thr Asp Ser Lys Gly Lys Val Leu Pro Glu Met Ile Leu
 85 90 95

Ile Cys Gln Asn Leu Arg Asn Asn Leu Gln His Pro Asn Glu Tyr Ile
 100 105 110

Arg Gly Val Thr Leu Arg Phe Leu Cys Arg Met Lys Glu Thr Glu Ile
 115 120 125

Val Glu Pro Leu Thr Pro Ser Val Leu Gln Asn Leu Glu His Arg His
 130 135 140

Pro Phe Val Arg Arg Asn Ala Ile Leu Ala Ile Met Ser Ile Tyr Lys
 145 150 155 160

Leu Pro His Gly Asp Gln Leu Phe Val Asp Ala Pro Glu Met Ile Glu
 165 170 175

Lys Val Leu Ser Thr Glu Gln Asp Pro Ser Ala Lys Arg Asn Ala Phe
 180 185 190

Leu Met Leu Phe Thr Cys Ala Glu Glu Arg Ala Val Asn Tyr Leu Leu
 195 200 205

Ser Asn Val Asp Lys Val Ser Asp Trp Asn Glu Ser Leu Gln Met Val
 210 215 220

Val Leu Glu Leu Ile Arg Ser Val Cys Lys Thr Lys Pro Ala Glu Lys
 225 230 235 240

Gly Lys Tyr Ile Lys Ile Ile Ile Ser Leu Leu Ser Ala Thr Ser Ser
 245 250 255

Ala Val Ile Tyr Glu Cys Ala Gly Thr Leu Val Ser Leu Ser Ser Ala
 260 265 270

Pro Thr Ala Ile Arg Ala Ala Ala Asn Thr Tyr Cys Gln Leu Leu Leu
 275 280 285

Ser Gln Ser Asp Asn Asn Val Lys Leu Ile Leu Leu Asp Arg Leu Tyr
 290 295 300

Glu Leu Lys Thr Leu His Arg Asp Ile Met Val Glu Leu Ile Ile Asp
 305 310 315 320

Val Leu Arg Ala Leu Ser Ser Pro Asn Leu Asp Ile Arg Arg Lys Thr
 325 330 335

Leu Asp Ile Ala Leu Asp Leu Ile Thr His His Asn Ile Asn Glu Val
 340 345 350

85/121

Val Gln Met Leu Lys Lys Glu Val Val Lys Thr Gln Ser Gly Glu Leu
355 360 365

Glu Lys Asn Gly Glu Tyr Arg Gln Met Leu Ile Gln Ala Ile His Ala
370 375 380

Cys Ala Val Lys Phe Pro Glu Val Ala Ser Thr Val Val His Leu Leu
385 390 395 400

Met Asp Phe Leu Gly Asp Ser Asn Val Ala Ser Ala Leu Asp Val Val
405 410 415

Val Phe Val Arg Glu Ile Ile Glu Thr Asn Pro Lys Leu Arg Val Ser
420 425 430

Ile Ile Thr Arg Leu Leu Asp Thr Phe Tyr Gln Ile Arg Ala Gly Lys
435 440 445

Val Cys Pro Cys Ala Leu Trp Ile Ile Gly Glu Tyr Cys Leu Ser Leu
450 455 460

Ser Glu Val Glu Ser Gly Ile Ser Thr Ile Thr Gln Cys Leu Gly Glu
465 470 475 480

Leu Pro Phe Tyr Ser Val Ser Glu Glu Ser Glu Pro Thr Glu Thr Ser
485 490 495

Lys Lys Ile Gln Pro Thr Ser Ser Ala Met Val Ser Ser Arg Lys Pro
500 505 510

Val Ile Leu Ala Asp Gly Thr Tyr Ala Thr Gln Ser Ala Ala Ser Glu
515 520 525

Thr Thr Phe Ser Ser Pro Thr Val Val Gln Gly Ser Leu Thr Ser Gly
530 535 540

Asn Leu Arg Ala Leu Leu Leu Thr Gly Asp Phe Phe Leu Gly Ala Val
545 550 555 560

Val Ala Cys Thr Leu Thr Lys Leu Val Leu Arg Leu Glu Glu Val Gln
565 570 575

Ser Ser Lys Thr Glu Val Asn Lys Thr Val Ser Gln Ala Leu Leu Ile
580 585 590

Met Val Ser Ile Leu Gln Leu Gly Gln Ser Pro Val Ser Pro His Pro
 595 600 605

Ile Asp Asn Asp Ser Tyr Glu Arg Ile Met Leu Cys Ile Lys Leu Leu
 610 615 620

Cys His Arg Asn Val Glu Met Lys Lys Ile Trp Leu Glu Ser Cys Arg
 625 630 635 640

Gln Ser Phe Val Lys Met Ile Ser Glu Lys Gln Leu Arg Glu Met Glu
 645 650 655

Glu Leu Lys Ala Lys Thr Gln Thr Thr His Ala Gln Pro Asp Asp Leu
 660 665 670

Ile Asp Phe Phe His Leu Lys Ser Arg Lys Gly Met Ser Gln Leu Glu
 675 680 685

Leu Glu Asp Gln Val Gln Asp Asp Leu Lys Arg Ala Thr Gly Glu Phe
 690 695 700

Thr Lys Asp Glu Asn Asp Ala Asn Lys Leu Asn Arg Ile Leu Gln Leu
 705 710 715 720

Thr Gly Phe Ser Asp Pro Val Tyr Ala Glu Ala Tyr Val Thr Val His
 725 730 735

His Tyr Asp Ile Ala Leu Glu Val Thr Val Ile Asn Arg Thr Lys Glu
 740 745 750

Thr Leu Gln Asn Leu Cys Leu Glu Leu Ala Thr Met Gly Asp Leu Lys
 755 760 765

Leu Val Glu Arg Pro Gln Asn Tyr Ser Leu Ala Pro Glu Arg Ser Met
 770 775 780

Gln Ile Lys Ala Asn Ile Lys Val Ser Ser Thr Glu Thr Gly Val Ile
 785 790 795 800

Phe Gly Asn Ile Val Tyr Glu Thr Ser Asn Val Met Glu Arg Asn Val
 805 810 815

87/121

Val Val Leu Asn Asp Ile His Ile Asp Ile Met Asp Tyr Ile Ser Pro
820 825 830

Ala Val Cys Ser Glu Val Ala Phe Arg Thr Met Trp Ala Glu Phe Glu
835 840 845

Trp Glu Asn Lys Val Ala Val Asn Thr Thr Ile Gln Asn Glu Arg Glu
850 855 860

Phe Leu Asp His Ile Ile Lys Ser Thr Asn Met Lys Cys Leu Thr Ala
865 870 875 880

Pro Ser Ala Ile Ala Gly Glu Cys Gly Phe Leu Ala Ala Asn Leu Tyr
885 890 895

Ala Lys Ser Val Phe Gly Glu Asp Ala Leu Val Asn Leu Ser Ile Glu
900 905 910

Lys Gln Thr Asp Gly Thr Leu Ser Gly Tyr Ile Arg Ile Arg Ser Lys
915 920 925

Thr Gln Gly Ile Ala Leu Ser Leu Gly Asp Lys Ile Thr Leu Lys Gln
930 935 940

Lys Gly Gly Ser
945

<210> 69

<211> 1086

<212> DNA

<213> Arabidopsis thaliana

<400> 69

atggcgaaat ctcagatctg gtttggtttt gcgttactcg cgttgcttct ggtttcagcc	60
gtagctgacg atgtggttgt tttgactgac gatagcttcg aaaaggaagt tggtaaagat	120
aaaggagctc tcgtcgagtt ttacgctccc tgggtgggtc actgcaagaa acttgctcca	180
gagtatgaaa agctaggggc aagcttcaag aaggctaagt ctgtgttgat tgcaaagggt	240
gattgtgatg agcaaaagag tgtctgtact aaatatggtg ttagtggata cccaaccatt	300
cagtggtttc ctaaaggatc tcttgaacct caaaagtatg agggccacg caatgctgaa	360
gctttggctg aatacgtgaa caaggaagga ggcaccaacg taaaattagc tgcagttcca	420
caaaacgtgg ttgttttgac acctgacaat ttcgatgaga ttgttctgga tcaaaacaaa	480


```

gatgtcctag tcgaatttta tgcacccatgg tgtggccact gcaaactcact cgctcccaca 540
tacgaaaagg tagccacagt gtttaaacag gaagaagggtg tagtcacgc caatttggat 600
gctgatgcac acaaagccct tggcgagaaa tatggagtga gtggattccc aacattgaaa 660
ttcttcccaa aggacaacaa agctgggtcac gattatgacg gtggcagggg tttagatgac 720
tttgtaagct tcatcaacga gaaatctggg accagcaggg acagtaaagg gcagcttact 780
tcaaaggctg gtatagtcga aagcttagat gctttggtaa aagagttagt tgcagctagt 840
gaagatgaga agaaggcagt gttgtctcgc atagaagagg aagcaagtac ccttaagggc 900
tccaccacga ggtatggaaa gctttacttg aaactcgcaa agagctacat agaaaaaggt 960
tcagactatg ctagcaaaga aacggagagg cttggacggg tgcttgggaa gtcgataagt 1020
ccagtgaaag ctgatgaact cactctcaag agaaatatcc taaccacgtt cgttgcttct 1080
tcttaa 1086

```

<210> 70
 <211> 361
 <212> PRT
 <213> Arabidopsis thaliana

```

<400> 70
Met Ala Lys Ser Gln Ile Trp Phe Gly Phe Ala Leu Leu Ala Leu Leu
1          5          10          15

Leu Val Ser Ala Val Ala Asp Asp Val Val Val Leu Thr Asp Asp Ser
20          25          30

Phe Glu Lys Glu Val Gly Lys Asp Lys Gly Ala Leu Val Glu Phe Tyr
35          40          45

Ala Pro Trp Cys Gly His Cys Lys Lys Leu Ala Pro Glu Tyr Glu Lys
50          55          60

Leu Gly Ala Ser Phe Lys Lys Ala Lys Ser Val Leu Ile Ala Lys Val
65          70          75          80

Asp Cys Asp Glu Gln Lys Ser Val Cys Thr Lys Tyr Gly Val Ser Gly
85          90          95

Tyr Pro Thr Ile Gln Trp Phe Pro Lys Gly Ser Leu Glu Pro Gln Lys
100         105         110

```

89/121

Tyr Glu Gly Pro Arg Asn Ala Glu Ala Leu Ala Glu Tyr Val Asn Lys
115 120 125

Glu Gly Gly Thr Asn Val Lys Leu Ala Ala Val Pro Gln Asn Val Val
130 135 140

Val Leu Thr Pro Asp Asn Phe Asp Glu Ile Val Leu Asp Gln Asn Lys
145 150 155 160

Asp Val Leu Val Glu Phe Tyr Ala Pro Trp Cys Gly His Cys Lys Ser
165 170 175

Leu Ala Pro Thr Tyr Glu Lys Val Ala Thr Val Phe Lys Gln Glu Glu
180 185 190

Gly Val Val Ile Ala Asn Leu Asp Ala Asp Ala His Lys Ala Leu Gly
195 200 205

Glu Lys Tyr Gly Val Ser Gly Phe Pro Thr Leu Lys Phe Phe Pro Lys
210 215 220

Asp Asn Lys Ala Gly His Asp Tyr Asp Gly Gly Arg Asp Leu Asp Asp
225 230 235 240

Phe Val Ser Phe Ile Asn Glu Lys Ser Gly Thr Ser Arg Asp Ser Lys
245 250 255

Gly Gln Leu Thr Ser Lys Ala Gly Ile Val Glu Ser Leu Asp Ala Leu
260 265 270

Val Lys Glu Leu Val Ala Ala Ser Glu Asp Glu Lys Lys Ala Val Leu
275 280 285

Ser Arg Ile Glu Glu Glu Ala Ser Thr Leu Lys Gly Ser Thr Thr Arg
290 295 300

Tyr Gly Lys Leu Tyr Leu Lys Leu Ala Lys Ser Tyr Ile Glu Lys Gly
305 310 315 320

Ser Asp Tyr Ala Ser Lys Glu Thr Glu Arg Leu Gly Arg Val Leu Gly
325 330 335

Lys Ser Ile Ser Pro Val Lys Ala Asp Glu Leu Thr Leu Lys Arg Asn
340 345 350

Ile Leu Thr Thr Phe Val Ala Ser Ser
 355 360

<210> 71
 <211> 744
 <212> DNA
 <213> Arabidopsis thaliana

<400> 71
 atggcgctcga gcgatgagcg tccaggagcg tatccggcac gtgacggatc agagaactta 60
 cctccggggag atccaaagac gatgaagacg gtggtgatgg ataaaggagc ggcgatgatg 120
 caatcggtga aaccgatcaa acagatgagt ctccatttgt gttctttcgc ttgttatggg 180
 cacgatecta gccgtcagat tgaagtcaac ttctatgttc atcgactcaa ccaagacttt 240
 cttcaatgtg ctgtttacga ttgcgactcc tctaaacccc atctcatcgg gatcgagtat 300
 attgtgtcgg agaggttatt tgagagtctt gatccggagg agcaaaagct ttggcactct 360
 catgactatg agatccaaac aggccttcta gtaactccaa gggtcctga gcttgtagct 420
 aagacagagc ttgaaaatat tgccaaaact tatgggaagt tttggtgcac ttggcagacc 480
 gatcgcgggg ataaattgcc acttggtgca ccatcactta tgatgtcacc acaagacgtg 540
 aatatgggaa agatcaagcc agggctattg aagaaacgtg acgatgagta tggaatctcg 600
 acggaatctt tgaagacgtc tcgagttgga attatgggac cggagaagaa aaattcgatg 660
 gctgattatt gggttcatca cggaaaagga ttagcggttg acataatcga aactgagatg 720
 cagaaattgg ctccgttccc gtaa 744

<210> 72
 <211> 247
 <212> PRT
 <213> Arabidopsis thaliana

<400> 72
 Met Ala Ser Ser Asp Glu Arg Pro Gly Ala Tyr Pro Ala Arg Asp Gly
 1 5 10 15
 Ser Glu Asn Leu Pro Pro Gly Asp Pro Lys Thr Met Lys Thr Val Val
 20 25 30
 Met Asp Lys Gly Ala Ala Met Met Gln Ser Leu Lys Pro Ile Lys Gln
 35 40 45

91/121

Met Ser Leu His Leu Cys Ser Phe Ala Cys Tyr Gly His Asp Pro Ser
50 55 60

Arg Gln Ile Glu Val Asn Phe Tyr Val His Arg Leu Asn Gln Asp Phe
65 70 75 80

Leu Gln Cys Ala Val Tyr Asp Cys Asp Ser Ser Lys Pro His Leu Ile
85 90 95

Gly Ile Glu Tyr Ile Val Ser Glu Arg Leu Phe Glu Ser Leu Asp Pro
100 105 110

Glu Glu Gln Lys Leu Trp His Ser His Asp Tyr Glu Ile Gln Thr Gly
115 120 125

Leu Leu Val Thr Pro Arg Val Pro Glu Leu Val Ala Lys Thr Glu Leu
130 135 140

Glu Asn Ile Ala Lys Thr Tyr Gly Lys Phe Trp Cys Thr Trp Gln Thr
145 150 155 160

Asp Arg Gly Asp Lys Leu Pro Leu Gly Ala Pro Ser Leu Met Met Ser
165 170 175

Pro Gln Asp Val Asn Met Gly Lys Ile Lys Pro Gly Leu Leu Lys Lys
180 185 190

Arg Asp Asp Glu Tyr Gly Ile Ser Thr Glu Ser Leu Lys Thr Ser Arg
195 200 205

Val Gly Ile Met Gly Pro Glu Lys Lys Asn Ser Met Ala Asp Tyr Trp
210 215 220

Val His His Gly Lys Gly Leu Ala Val Asp Ile Ile Glu Thr Glu Met
225 230 235 240

Gln Lys Leu Ala Pro Phe Pro
245

<210> 73

<211> 954

<212> DNA

<213> Arabidopsis thaliana

<400> 73
 atggcgactc ttaaggtttc tgattctggt cctgctcctt ctgatgatgc tgagcaattg 60
 agaaccgctt ttgaaggatg gggtagcaac gaggacttga tcatatcaat cttggctcac 120
 agaagtgcgtg aacagaggaa agtcatcagg caagcatacc acgaaaccta cggcgaagac 180
 cttctcaaga ctcttgacaa ggagctctct aacgatttcg agagagctat cttgttgtgg 240
 actcttgaac ccggtgagcg tgatgcttta ttggctaata aagctacaaa aagatggact 300
 tcaagcaacc aagttcttat ggaagttgct tgcacaagga catcaacgca gctgcttcac 360
 gctaggcaag cttaccatgc tcgctacaag aagtctcttg aagaggacgt tgctcaccac 420
 actaccggtg acttcagaaa gcttttggtt tctcttggtt cctcatacag gtacgaagga 480
 gatgaagtga acatgacatt ggctaagcaa gaagctaagc tgggtccatga gaaaatcaag 540
 gacaagcact acaatgatga ggatgttatt agaattcttg ccacaagaag caaagctcag 600
 atcaatgcta cttttaaccg ttaccaagat gatcatggcg aggaaattct caagagtctt 660
 gaggaaggag atgatgatga caagttcctt gcacttttga ggtcaaccat tcagtgttg 720
 acaagaccag agctttactt tgcgatggtt cttcggttcag caatcaacaa aactggaact 780
 gatgaaggag cactcactag aattgtgacc acaagagctg agattgactt gaaggtcatt 840
 ggagaggagt accagcgcag gaacagcatt cctttggaga aagctattac caaagacact 900
 cgtggagatt acgagaagat gctcgtcgca cttctcggtg aagatgatgc ttaa 954

<210> 74
 <211> 317
 <212> PRT
 <213> Arabidopsis thaliana

<400> 74
 Met Ala Thr Leu Lys Val Ser Asp Ser Val Pro Ala Pro Ser Asp Asp
 1 5 10 15
 Ala Glu Gln Leu Arg Thr Ala Phe Glu Gly Trp Gly Thr Asn Glu Asp
 20 25 30
 Leu Ile Ile Ser Ile Leu Ala His Arg Ser Ala Glu Gln Arg Lys Val
 35 40 45
 Ile Arg Gln Ala Tyr His Glu Thr Tyr Gly Glu Asp Leu Leu Lys Thr
 50 55 60
 Leu Asp Lys Glu Leu Ser Asn Asp Phe Glu Arg Ala Ile Leu Leu Trp
 65 70 75 80

Thr Leu Glu Pro Gly Glu Arg Asp Ala Leu Leu Ala Asn Glu Ala Thr
 85 90 95

Lys Arg Trp Thr Ser Ser Asn Gln Val Leu Met Glu Val Ala Cys Thr
 100 105 110

Arg Thr Ser Thr Gln Leu Leu His Ala Arg Gln Ala Tyr His Ala Arg
 115 120 125

Tyr Lys Lys Ser Leu Glu Glu Asp Val Ala His His Thr Thr Gly Asp
 130 135 140

Phe Arg Lys Leu Leu Val Ser Leu Val Thr Ser Tyr Arg Tyr Glu Gly
 145 150 155 160

Asp Glu Val Asn Met Thr Leu Ala Lys Gln Glu Ala Lys Leu Val His
 165 170 175

Glu Lys Ile Lys Asp Lys His Tyr Asn Asp Glu Asp Val Ile Arg Ile
 180 185 190

Leu Ser Thr Arg Ser Lys Ala Gln Ile Asn Ala Thr Phe Asn Arg Tyr
 195 200 205

Gln Asp Asp His Gly Glu Glu Ile Leu Lys Ser Leu Glu Glu Gly Asp
 210 215 220

Asp Asp Asp Lys Phe Leu Ala Leu Leu Arg Ser Thr Ile Gln Cys Leu
 225 230 235 240

Thr Arg Pro Glu Leu Tyr Phe Val Asp Val Leu Arg Ser Ala Ile Asn
 245 250 255

Lys Thr Gly Thr Asp Glu Gly Ala Leu Thr Arg Ile Val Thr Thr Arg
 260 265 270

Ala Glu Ile Asp Leu Lys Val Ile Gly Glu Glu Tyr Gln Arg Arg Asn
 275 280 285

Ser Ile Pro Leu Glu Lys Ala Ile Thr Lys Asp Thr Arg Gly Asp Tyr
 290 295 300

Glu Lys Met Leu Val Ala Leu Leu Gly Glu Asp Asp Ala
 305 310 315

<210> 75
 <211> 1170
 <212> DNA
 <213> Arabidopsis thaliana

<400> 75
 atggtggatc tattgaactc ggtgatgaac ctggtggcgc ctccagcgac catggtgggtg 60
 atggcctttg catggccatt actgtctttc attagcttct ccgaacgggc ttacaactct 120
 tatttcgcca ccgaaaatat ggaagataaa gtagttgtca tcaccggagc ttcacggcc 180
 attggagagc aaatagcata tgaatatgca aaaagaggag cgaatttggt gttggtggcg 240
 aggagagagc agagactgag agttgtgagt aataaggcta aacagattgg agccaacat 300
 gtgatcatca tcgctgctga tgtcatcaaa gaagatgact gccgccgttt tatcacccaa 360
 gccgtcaact attacggccg cgtggatcat ctagtgaata cagcgagtct tggacacact 420
 ttttactttg aggaagtgag tgacacgact gtgtttccac atttgctgga cataaacttc 480
 tgggggaatg tttatccgac atacgtagcg ttgccatacc ttcaccagac gaatggccga 540
 atagtcgtga atgcatcggg tgaaaactgg ttgcctctac cacggatgag tctttattct 600
 gctgcaaaaag cagcattagt caacttctat gagacgctgc gtttcgagct aaatggagac 660
 gttggtataa ctatcgcgac tcacgggtgg attggcagtg agatgagtgg aggaaagtcc 720
 atgctagaag aaggtgctga gatgcaatgg aaggaagaga gagaagtacc tgcaaaggt 780
 ggaccgctag aggaatttgc aaagatgatt gtggcaggag cttgtagggg agatgcatat 840
 gtgaagtttc caaactggta cgatgtcttt ctctctatc gagtcttcac accgaatgta 900
 ctgagatgga cattcaagtt gttactgtct actgagggtg cacgtagaag ctcccttgtt 960
 ggggtcgggt caggtatgcc tgtggatgaa tcctcttcac aaatgaaact tatgcttgaa 1020
 ggaggaccac ctcgagttcc tgcaagccca cctaggtata ccgcaagccc acctcattat 1080
 accgcaagcc caccacggtg tcctgcaagc ccacctcggt atcctgagag cccacctcgg 1140
 ttttcacagt ttaatatcca agagttgtaa 1170

<210> 76
 <211> 389
 <212> PRT
 <213> Arabidopsis thaliana

<400> 76

Met	Val	Asp	Leu	Leu	Asn	Ser	Val	Met	Asn	Leu	Val	Ala	Pro	Pro	Ala
1			5					10					15		
Thr	Met	Val	Val	Met	Ala	Phe	Ala	Trp	Pro	Leu	Leu	Ser	Phe	Ile	Ser
		20						25					30		
Phe	Ser	Glu	Arg	Ala	Tyr	Asn	Ser	Tyr	Phe	Ala	Thr	Glu	Asn	Met	Glu
		35					40					45			
Asp	Lys	Val	Val	Val	Ile	Thr	Gly	Ala	Ser	Ser	Ala	Ile	Gly	Glu	Gln
	50					55					60				
Ile	Ala	Tyr	Glu	Tyr	Ala	Lys	Arg	Gly	Ala	Asn	Leu	Val	Leu	Val	Ala
65					70					75					80
Arg	Arg	Glu	Gln	Arg	Leu	Arg	Val	Val	Ser	Asn	Lys	Ala	Lys	Gln	Ile
				85					90					95	
Gly	Ala	Asn	His	Val	Ile	Ile	Ile	Ala	Ala	Asp	Val	Ile	Lys	Glu	Asp
			100					105					110		
Asp	Cys	Arg	Arg	Phe	Ile	Thr	Gln	Ala	Val	Asn	Tyr	Tyr	Gly	Arg	Val
		115					120					125			
Asp	His	Leu	Val	Asn	Thr	Ala	Ser	Leu	Gly	His	Thr	Phe	Tyr	Phe	Glu
	130					135					140				
Glu	Val	Ser	Asp	Thr	Thr	Val	Phe	Pro	His	Leu	Leu	Asp	Ile	Asn	Phe
145					150					155					160
Trp	Gly	Asn	Val	Tyr	Pro	Thr	Tyr	Val	Ala	Leu	Pro	Tyr	Leu	His	Gln
			165						170					175	
Thr	Asn	Gly	Arg	Ile	Val	Val	Asn	Ala	Ser	Val	Glu	Asn	Trp	Leu	Pro
			180					185					190		
Leu	Pro	Arg	Met	Ser	Leu	Tyr	Ser	Ala	Ala	Lys	Ala	Ala	Leu	Val	Asn
		195					200					205			
Phe	Tyr	Glu	Thr	Leu	Arg	Phe	Glu	Leu	Asn	Gly	Asp	Val	Gly	Ile	Thr
210						215					220				

96/121

Ile Ala Thr His Gly Trp Ile Gly Ser Glu Met Ser Gly Gly Lys Phe
225 230 235 240

Met Leu Glu Glu Gly Ala Glu Met Gln Trp Lys Glu Glu Arg Glu Val
245 250 255

Pro Ala Asn Gly Gly Pro Leu Glu Glu Phe Ala Lys Met Ile Val Ala
260 265 270

Gly Ala Cys Arg Gly Asp Ala Tyr Val Lys Phe Pro Asn Trp Tyr Asp
275 280 285

Val Phe Leu Leu Tyr Arg Val Phe Thr Pro Asn Val Leu Arg Trp Thr
290 295 300

Phe Lys Leu Leu Leu Ser Thr Glu Gly Thr Arg Arg Ser Ser Leu Val
305 310 315 320

Gly Val Gly Ser Gly Met Pro Val Asp Glu Ser Ser Ser Gln Met Lys
325 330 335

Leu Met Leu Glu Gly Gly Pro Pro Arg Val Pro Ala Ser Pro Pro Arg
340 345 350

Tyr Thr Ala Ser Pro Pro His Tyr Thr Ala Ser Pro Pro Arg Tyr Pro
355 360 365

Ala Ser Pro Pro Arg Tyr Pro Ala Ser Pro Pro Arg Phe Ser Gln Phe
370 375 380

Asn Ile Gln Glu Leu
385

<210> 77

<211> 990

<212> DNA

<213> Arabidopsis thaliana

<400> 77

```
atggctggaa aactcatgca cgctcttcag tacaactctt acggtggtgg cgccgccgga      60
ttagagcatg ttcaagttcc ggttccaaca ccaaagagta atgaggtttg cctgaaatta      120
gaagctacta gtctaaaccc tgttgattgg aaaattcaga aaggaatgat ccgcccattt      180
ctgccccgca agttccctg cattccagct actgatgttg ctggagaggt cgttgaggtt      240
```

97/121

ggatcaggag taaaaaattt taaggctggt gacaaagttg tagcggttct tagccatcta 300
ggtggagggtg gacttgctga gttcgctgtt gcaaccgaga agctgactgt caaaagacct 360
caagaagtgg gaggagctga agcagcagct ttacctgtgg cgggtctaac cgctctccaa 420
gctcttacta atcctgcggg gttgaagctg gatggtacag gcaagaaggc gaacatcctg 480
gtcacagcag catctggtgg ggttggtcac tatgcagtcc agctggcaaa acttgcaaat 540
gctcacgtaa ccgctacatg tggtgcccgg aacatagagt ttgtcaaatac gttgggagcg 600
gatgaggttc tcgactacaa gactcccagag ggagccgccc tcaagagtcc gtcgggtaaa 660
aaatatgacg ctgtggtcca ttgtgcaaac gggattccat tttcgggtatt cgaaccaaata 720
ttgtcggaata acgggaagggt gatagacatc acaccggggc ctaatgcaat gtggacttat 780
gcggttaaga aaataacat gtcaaagaag cagttagtgc cactcttgtt gatcccaaaa 840
gctgagaatt tggagtttat ggtgaatcta gtgaaagaag ggaaagtga gacagtgatt 900
gactcaaagc atcctttgag caaagcggag gatgcttggg ccaaagtat cgatgggtcat 960
gctactggga agatcattgt cgagccataa 990

<210> 78

<211> 329

<212> PRT

<213> *Arabidopsis thaliana*

<400> 78

Met Ala Gly Lys Leu Met His Ala Leu Gln Tyr Asn Ser Tyr Gly Gly
1 5 10 15

Gly Ala Ala Gly Leu Glu His Val Gln Val Pro Val Pro Thr Pro Lys
20 25 30

Ser Asn Glu Val Cys Leu Lys Leu Glu Ala Thr Ser Leu Asn Pro Val
35 40 45

Asp Trp Lys Ile Gln Lys Gly Met Ile Arg Pro Phe Leu Pro Arg Lys
50 55 60

Phe Pro Cys Ile Pro Ala Thr Asp Val Ala Gly Glu Val Val Glu Val
65 70 75 80

Gly Ser Gly Val Lys Asn Phe Lys Ala Gly Asp Lys Val Val Ala Val
85 90 95

98/121

Leu Ser His Leu Gly Gly Gly Gly Leu Ala Glu Phe Ala Val Ala Thr
100 105 110

Glu Lys Leu Thr Val Lys Arg Pro Gln Glu Val Gly Ala Ala Glu Ala
115 120 125

Ala Ala Leu Pro Val Ala Gly Leu Thr Ala Leu Gln Ala Leu Thr Asn
130 135 140

Pro Ala Gly Leu Lys Leu Asp Gly Thr Gly Lys Lys Ala Asn Ile Leu
145 150 155 160

Val Thr Ala Ala Ser Gly Gly Val Gly His Tyr Ala Val Gln Leu Ala
165 170 175

Lys Leu Ala Asn Ala His Val Thr Ala Thr Cys Gly Ala Arg Asn Ile
180 185 190

Glu Phe Val Lys Ser Leu Gly Ala Asp Glu Val Leu Asp Tyr Lys Thr
195 200 205

Pro Glu Gly Ala Ala Leu Lys Ser Pro Ser Gly Lys Lys Tyr Asp Ala
210 215 220

Val Val His Cys Ala Asn Gly Ile Pro Phe Ser Val Phe Glu Pro Asn
225 230 235 240

Leu Ser Glu Asn Gly Lys Val Ile Asp Ile Thr Pro Gly Pro Asn Ala
245 250 255

Met Trp Thr Tyr Ala Val Lys Lys Ile Thr Met Ser Lys Lys Gln Leu
260 265 270

Val Pro Leu Leu Leu Ile Pro Lys Ala Glu Asn Leu Glu Phe Met Val
275 280 285

Asn Leu Val Lys Glu Gly Lys Val Lys Thr Val Ile Asp Ser Lys His
290 295 300

Pro Leu Ser Lys Ala Glu Asp Ala Trp Ala Lys Ser Ile Asp Gly His
305 310 315 320

Ala Thr Gly Lys Ile Ile Val Glu Pro
325

<210> 79
 <211> 1389
 <212> DNA
 <213> *Physcomitrella patens*

<400> 79
 atggaaattc ccttaggtcg agatggcgag ggtatgcagt caaagcagtg cccgcgcggc 60
 cactggcgtc cagcggaaga cgacaagctg cgagaactag tgtcccagtt tggacctcaa 120
 aactggaatc tcatagcaga gaaacttcag ggtcgatcag ggaaaagctg caggctacgg 180
 tggttcaatc agctggaccc tcgcatcaac cggcacccat tctcggaaga agaggaagag 240
 cggctgctta tagcacacaa gcgctacggc aacaagtggg cattgatcgc gcgcctcttt 300
 ccgggcccga cagacaacgc ggtgaagaat cactggcacg ttgtgacggc aagacagtcc 360
 cgtgaacgga cacgaactta cggccgtatc aaaggtccgg tacatcgaag aggcaagggg 420
 aaccgtatca atacctccgc acttggaat taccatcacg attcgaaggg agctctcaca 480
 gcctggattg agtcgaagta tgcgacagtc gagcagtctg cggaagggt cgctaggtct 540
 ccttgtaccg gcagaggctc tctcctcta cccaccgggt tcagtatacc gcagatttcc 600
 ggcggcgcct tccatcgacc gacaaacatg agtactagtc ctcttagcga tgtgactatc 660
 gagtcgcaa agtttagcaa ctccgaaaat gcgcaaataa taaccgcgcc cgtcctgcaa 720
 aagccaatgg gagatcccag gtcagtatgc ttgccgaatt cgactgtttc cgacaagcag 780
 caagtgtgc agagtaattc catcgacggg cagatctcct ccggggtcca gacaagcgca 840
 atagtagcgc atgatgagaa atcgggcgtc atttcaatga atcatcaagc accggatatg 900
 tctgtgttg gattgaagtc aaattttcag gggagtctcc atcctggcgc tgtagatct 960
 tcttggaatc aatcccttcc ccactgtttt ggccacagta acaagttggg ggaggagtgc 1020
 aggagtctta caggcgcagc cactgaacgc tctgagattc tgcaagaaca gcattctagc 1080
 cttcagttta aatgcagcac tgcgtacaat actggaagat atcaacatga aaacctttgt 1140
 gggccagcat tctcgcaaca agacacagcg aacgagggtg cgaatttttc tacgttggca 1200
 ttctccggcc tagtgaagca tcgccaagag aggttgtgca aagatagtgg atctgctctc 1260
 aagctgggac tatcatgggt tacatccgat agcactcttg acttgagtgt tgccaaaatg 1320
 tcagcatcgc agccagagca gtctgcgccg gttgcattca ttgattttct aggcgtggga 1380
 gcggcctga 1389

<210> 80
 <211> 462
 <212> PRT
 <213> Physcomitrella patens

<400> 80

Met Glu Ile Pro Leu Gly Arg Asp Gly Glu Gly Met Gln Ser Lys Gln
 1 5 10 15

Cys Pro Arg Gly His Trp Arg Pro Ala Glu Asp Asp Lys Leu Arg Glu
 20 25 30

Leu Val Ser Gln Phe Gly Pro Gln Asn Trp Asn Leu Ile Ala Glu Lys
 35 40 45

Leu Gln Gly Arg Ser Gly Lys Ser Cys Arg Leu Arg Trp Phe Asn Gln
 50 55 60

Leu Asp Pro Arg Ile Asn Arg His Pro Phe Ser Glu Glu Glu Glu Glu
 65 70 75 80

Arg Leu Leu Ile Ala His Lys Arg Tyr Gly Asn Lys Trp Ala Leu Ile
 85 90 95

Ala Arg Leu Phe Pro Gly Arg Thr Asp Asn Ala Val Lys Asn His Trp
 100 105 110

His Val Val Thr Ala Arg Gln Ser Arg Glu Arg Thr Arg Thr Tyr Gly
 115 120 125

Arg Ile Lys Gly Pro Val His Arg Arg Gly Lys Gly Asn Arg Ile Asn
 130 135 140

Thr Ser Ala Leu Gly Asn Tyr His His Asp Ser Lys Gly Ala Leu Thr
 145 150 155 160

Ala Trp Ile Glu Ser Lys Tyr Ala Thr Val Glu Gln Ser Ala Glu Gly
 165 170 175

Leu Ala Arg Ser Pro Cys Thr Gly Arg Gly Ser Pro Pro Leu Pro Thr
 180 185 190

Gly Phe Ser Ile Pro Gln Ile Ser Gly Gly Ala Phe His Arg Pro Thr
 195 200 205

101/121

Asn Met Ser Thr Ser Pro Leu Ser Asp Val Thr Ile Glu Ser Pro Lys
210 215 220

Phe Ser Asn Ser Glu Asn Ala Gln Ile Ile Thr Ala Pro Val Leu Gln
225 230 235 240

Lys Pro Met Gly Asp Pro Arg Ser Val Cys Leu Pro Asn Ser Thr Val
245 250 255

Ser Asp Lys Gln Gln Val Leu Gln Ser Asn Ser Ile Asp Gly Gln Ile
260 265 270

Ser Ser Gly Leu Gln Thr Ser Ala Ile Val Ala His Asp Glu Lys Ser
275 280 285

Gly Val Ile Ser Met Asn His Gln Ala Pro Asp Met Ser Cys Val Gly
290 295 300

Leu Lys Ser Asn Phe Gln Gly Ser Leu His Pro Gly Ala Val Arg Ser
305 310 315 320

Ser Trp Asn Gln Ser Leu Pro His Cys Phe Gly His Ser Asn Lys Leu
325 330 335

Val Glu Glu Cys Arg Ser Ser Thr Gly Ala Cys Thr Glu Arg Ser Glu
340 345 350

Ile Leu Gln Glu Gln His Ser Ser Leu Gln Phe Lys Cys Ser Thr Ala
355 360 365

Tyr Asn Thr Gly Arg Tyr Gln His Glu Asn Leu Cys Gly Pro Ala Phe
370 375 380

Ser Gln Gln Asp Thr Ala Asn Glu Val Ala Asn Phe Ser Thr Leu Ala
385 390 395 400

Phe Ser Gly Leu Val Lys His Arg Gln Glu Arg Leu Cys Lys Asp Ser
405 410 415

Gly Ser Ala Leu Lys Leu Gly Leu Ser Trp Val Thr Ser Asp Ser Thr
420 425 430

Leu Asp Leu Ser Val Ala Lys Met Ser Ala Ser Gln Pro Glu Gln Ser
435 440 445

Ala Pro Val Ala Phe Ile Asp Phe Leu Gly Val Gly Ala Ala
 450 455 460

<210> 81
 <211> 963
 <212> DNA
 <213> Arabidopsis thaliana

<400> 81
 atggagatga acattaagtt tccagttata gacttgtcta agctcaatgg tgaagagaga 60
 gaccaaacca tggctttgat cgacgatgct tgtcaaaact ggggcttctt cgagctggtg 120
 aaccatggac taccatatga tctaattggac aacattgaga ggatgacaaa ggaacactac 180
 aagaaacata tggaaacaaaa gttcaaagaa atgcttcgtt ccaaagggtt agataccctc 240
 gagaccgaag ttgaagatgt cgattgggaa agcactttct acctccatca tctccctcaa 300
 tctaacctat acgacatccc tgatatgtca aatgaatacc gattggcaat gaaggatttt 360
 gggaagaggc ttgagattct agctgaagag ctattggact tgttgtgtga gaatctaggg 420
 ttggagaaag ggtacttgaa gaagggtgtt catgggacaa cgggtccaac ttttgcgaca 480
 aagcttagca actatccacc atgtcctaaa ccagagatga tcaaagggt tagggctcac 540
 acagatgcag gaggcctcat tttgctgtt caagatgata aggtcagtgg tctccagctt 600
 cttaaagatg gtgattgggt tgatgttcct cctctcaagc attccattgt catcaacctt 660
 ggtgaccaac ttgaggtgat aacaaacggg aagtacaaga gtgtaatgca ccgtgtgatg 720
 acccagaaag aaggaaacag gatgtctatc gcgtcggtttt acaaccccg aagcgatgct 780
 gagatctctc cggcaacatc tcttgtggat aaagactcaa aatacccaag ctttgtgttt 840
 gatgactaca tgaaactcta tgccggactc aagtttcagg ccaaggagcc acggttcgag 900
 gcgatgaaaa atgctgaagc agctgcggat ttgaatccgg tggctgtggt tgagacattc 960
 taa 963

<210> 82
 <211> 320
 <212> PRT
 <213> Arabidopsis thaliana

<400> 82
 Met Glu Met Asn Ile Lys Phe Pro Val Ile Asp Leu Ser Lys Leu Asn
 1 5 10 15

103/121

Gly Glu Glu Arg Asp Gln Thr Met Ala Leu Ile Asp Asp Ala Cys Gln
20 25 30

Asn Trp Gly Phe Phe Glu Leu Val Asn His Gly Leu Pro Tyr Asp Leu
35 40 45

Met Asp Asn Ile Glu Arg Met Thr Lys Glu His Tyr Lys Lys His Met
50 55 60

Glu Gln Lys Phe Lys Glu Met Leu Arg Ser Lys Gly Leu Asp Thr Leu
65 70 75 80

Glu Thr Glu Val Glu Asp Val Asp Trp Glu Ser Thr Phe Tyr Leu His
85 90 95

His Leu Pro Gln Ser Asn Leu Tyr Asp Ile Pro Asp Met Ser Asn Glu
100 105 110

Tyr Arg Leu Ala Met Lys Asp Phe Gly Lys Arg Leu Glu Ile Leu Ala
115 120 125

Glu Glu Leu Leu Asp Leu Leu Cys Glu Asn Leu Gly Leu Glu Lys Gly
130 135 140

Tyr Leu Lys Lys Val Phe His Gly Thr Thr Gly Pro Thr Phe Ala Thr
145 150 155 160

Lys Leu Ser Asn Tyr Pro Pro Cys Pro Lys Pro Glu Met Ile Lys Gly
165 170 175

Leu Arg Ala His Thr Asp Ala Gly Gly Leu Ile Leu Leu Phe Gln Asp
180 185 190

Asp Lys Val Ser Gly Leu Gln Leu Leu Lys Asp Gly Asp Trp Val Asp
195 200 205

Val Pro Pro Leu Lys His Ser Ile Val Ile Asn Leu Gly Asp Gln Leu
210 215 220

Glu Val Ile Thr Asn Gly Lys Tyr Lys Ser Val Met His Arg Val Met
225 230 235 240

Thr Gln Lys Glu Gly Asn Arg Met Ser Ile Ala Ser Phe Tyr Asn Pro
245 250 255

Gly Ser Asp Ala Glu Ile Ser Pro Ala Thr Ser Leu Val Asp Lys Asp
 260 265 270

Ser Lys Tyr Pro Ser Phe Val Phe Asp Asp Tyr Met Lys Leu Tyr Ala
 275 280 285

Gly Leu Lys Phe Gln Ala Lys Glu Pro Arg Phe Glu Ala Met Lys Asn
 290 295 300

Ala Glu Ala Ala Ala Asp Leu Asn Pro Val Ala Val Val Glu Thr Phe
 305 310 315 320

<210> 83

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 83

atggcgcgcc atggcaatct tccgaagtac actagt

36

<210> 84

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 84

gcttaattaa ttaagggcac ttgagacggc ca

32

<210> 85

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 85

atggcgcgcc aacaatggag aatggagcaa cgacg

35

<210> 86

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 86

gcttaattaa ctatatgggtt ggatattgag tcttggc

37

<210> 87

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 87

atggcgcgcc atggctgaaa aagtaaagtc tgggtca

36

<210> 88

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 88

gcttaattaa ttatagctcc tcagatccct ccga

34

<210> 89

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 89

atggcgcgcc atggctggag aagaaataga gaggg

35

<210> 90

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 90

gcttaattaa ttaaacagag gcttctctac tctcactt

38

<210> 91

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 91

atggcgcgcc atggctggag tgatgaagtt ggc

33

<210> 92

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 92

gcttaattaa tcacctcacg gtgttgcaagt tg

32

<210> 93

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 93

atggcgcgcc aaacaatggg gcttgctgtg gtgg

34

<210> 94

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 94

gcttaattaa ttactgcaag gctttcaata tatttc

36

<210> 95

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 95

atggcgcgcc aacaatggcg ttcacggcgc ttgt

34

<210> 96
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 96
gcttaattaa tcaacaagta ggataaggaa caccaca

37

<210> 97
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 97
atggcgcgcc aacaatggcc ctgatgagc ttctcaag

38

<210> 98
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 98
gcttaattaa tcagagagaa gcagagtttg ttgcg

35

<210> 99
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 99
atggcgcgcc aacaatggcg caatcccgat tattag

36

<210> 100
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 100
gcttaattaa ttaaaaccac tcgcctctca tttc

34

<210> 101
<211> 31
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 101
atggcgcgcc atgtccgtgg ctcgattcga t

31

<210> 102
<211> 37
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 102
gcttaattaa ctaatcctct agctcgatga ttttgac

37

<210> 103
<211> 41
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 103
atggcgcgcc aacaatggcg atttacagat ctctaagaaa g

41

<210> 104
<211> 38
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 104
gcttaattaa ttaccttaga taagtgatcc atgtctgg

38

<210> 105
<211> 41
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 105
atggcgcgcc aacaatggta aaggaaactc taattcctcc g 41

<210> 106
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 106
gcttaattaa ctaccagccg aagattggct tgt 33

<210> 107
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 107
atggcgcgcc atttggagag caatggcgac tt 32

<210> 108
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 108
gcttaattaa ttacatcgaa cgaagaagca tcaa 34

<210> 109
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 109
atggcgcgcc catcctcaga aagaatggct caaa 34

<210> 110
<211> 35
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 110

gcttaattaa ttagctttct tcaccatcat cgggtg

35

<210> 111

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 111

atggcgcgcc aacaatgggt gcaggtggaa gaatgcc

37

<210> 112

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 112

gcttaattaa tcataactta ttgttgtagc agtacacacc

40

<210> 113

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 113

atggcgcgcc aacaatgggt tcaataaatg aagatgtgtc t

41

<210> 114

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 114

gacttaatta atcaattggt gggattaacg actcca

36

<210> 115

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 115

atggcgcgcc aacaatggct acattctctt gtaattctta tga

43

<210> 116

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 116

gacttaatta atcagaagcg gccattaaaa ttaccca

37

<210> 117

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 117

ataagaatgc ggccgcatg gcaacggaat gcattgca

38

<210> 118

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 118

ataagaatgc ggccgcttag aaacttcttc tggtctt

37

<210> 119

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 119

ataagaatgc ggccgcatg gcgtcagagc aagcaagg

38

<210> 120
<211> 37
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 120
ataagaatgc ggccgctcaa cgttgtccat gttcccg

37

<210> 121
<211> 39
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 121
ataagaatgc ggccgccatg gctaagtctt gctatttca

39

<210> 122
<211> 38
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 122
ataagaatgc ggccgctcag gcgctatagc ctaagatt

38

<210> 123
<211> 41
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 123
ataagaatgc ggccgccatg gacggtgccg gagaatcacg a

41

<210> 124
<211> 38
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 124
ataagaatgc ggccgcctaa taacttaaag ttaccgga

38

<210> 125

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 125

ataagaatgc ggccgcatg tcgagagctt tgtcagtcg

39

<210> 126

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 126

ataagaatgc ggccgcatg tcgagagctt tgtcagtcg

39

<210> 127

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 127

ataagaatgc ggccgcatg gcaagcagcg acgtgaagct

40

<210> 128

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 128

ataagaatgc ggccgctcaa ccaagccaag aagcaccc

38

<210> 129

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 129
ataagaatgc ggccgcatg gcgtctcaac aagagaaga 39

<210> 130
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 130
ataagaatgc ggccgcttag gtcttggtcc tgaatttg 38

<210> 131
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 131
ggttaattaa ggcgcgcccc cggaagcgat gctgag 36

<210> 132
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 132
atctcgagga cgtcccacag ccaccggatt c 31

<210> 133
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 133
ataagaatgc ggccgcatg gctccttcaa caaaagttc 39

<210> 134
<211> 38
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 134

ataagaatgc ggccgctcaa acactgctga tagtattt

38

<210> 135

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 135

ataagaatgc ggccgcatg cggcgcttc cacctccct

39

<210> 136

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 136

ataagaatgc ggccgcttac ttttgtaatg gtgagagc

38

<210> 137

<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 137

ataagaatgc ggccgcatg cttctaattc tagcgattt

39

<210> 138

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 138

ataagaatgc ggccgctcag ataacccttct tcttctcg

38

<210> 139

<211> 35

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 139
attgcggccg cacaatggca catgccacgt ttacg 35

<210> 140
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 140
attgcggccg cttagtcttc atggtcccat agatc 35

<210> 141
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 141
gcggccgcca tggcgtctga gaaacaaaaa c 31

<210> 142
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 142
aggcctttac gcatttacca cagctcc 27

<210> 143
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 143
gcggccgcat ggattcaacg aagcttagtg agc 33

<210> 144
<211> 28
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 144

aggcctttac tgaggctctg caaatttg

28

<210> 145
<211> 30
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 145

gcggccgcca tgaaggttca cgagacaaga

30

<210> 146
<211> 27
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 146

aggcctctac tctggttcga catcgac

27

<210> 147
<211> 29
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 147

gcggccgcca tgtctacccc agctgaatc

29

<210> 148
<211> 27
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 148

aggcctctaa ttgtagagat catcatc

27

<210> 149
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 149
gcggccgcca tggacaaatc tagtaccatg 30

<210> 150
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 150
aggccttcag ctaccaccct tttgtttgag 30

<210> 151
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 151
gcggccgcca tggcgaaatc tcagatctgg 30

<210> 152
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 152
aggcctttaa gaagaagcaa cgaacgtg 28

<210> 153
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 153
gcggccgcca tggcgtcgag cgatgagcg

29

<210> 154
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 154
gatattcttac gggaacggag ccaatttc

28

<210> 155
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 155
gcggccgcca tggcgactct taaggtttct g

31

<210> 156
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 156
aggcctttaa gcatcatctt caccgag

27

<210> 157
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 157
gcggccgcca tgggtgatct attgaactcg

30

<210> 158
<211> 28
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 158

aggcctttac aactcttgga tattaaac

28

<210> 159

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 159

gcggccgcca tggctggaaa actcatgcac

30

<210> 160

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 160

aggcctttat ggctcgacaa tgatcttc

28

<210> 161

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 161

caggaaacag ctatgacc

18

<210> 162

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 162

ctaaaggga caaaagctg

19

<210> 163

<211> 18

121/121

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 163

tgtaaaacga cggccagt

18